THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXVI. No. 636.] LONDON, JULY 20, 1875. [27TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL
COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 80, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
Address G. H. RAMSAY, NEWCASTLE-ON-TYNE.

GENUINE TORBAY PAINT
AND
SPECIAL GASOMETER PAINT
(Mixed ready for use).
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
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(SUCCESSORS TO SAMUEL CALLEY. ESTABLISHED 20 YEARS.)
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WORKS: BRIXHAM, TORBAY.

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SPECIALITIES IN WOOD GRIDS
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PURIFIERS & SCRUBBERS
MADE FROM THE BEST QUALITY
OF
WELL-SEASONED PLANKS.
BROOKFIELD WORKS,
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JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and OTHER OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
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Established at the commencement of Gas Lighting.
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Warranted to Measure correctly, and not to vary.
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INVENTORS AND PATENTEES

OF THE

FRICTIONLESS DRY GAS-METERS,

Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

To Gas Companies supplying gas through streets with heavy gradients, these Meters are invaluable, as much gas is saved from the low pressure required to work them.

ALL METERS ARE UPHELD FOR FIVE YEARS.

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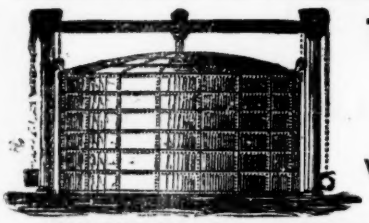

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Retorts, Retort-Fittings, Condensers, Scrubbers, Purifiers, Station-Meters, Governors, Rack and Screw Valves. Gas and Water Mains always in Stock.

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Combining most recent improvements in principle and manufacture; upwards of 200,000 already in work, giving highest satisfaction.
(A guarantee of five years given with every Meter.)

PLUMBERS WORK, including Lift and Force Pumps; Cocks for Gas and Water and Steam; Brass Fittings.

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THE UNVARYING WATER-LINE GAS-METER,

AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

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And all kinds of Experimental Gas Apparatus.

1862.

PATENT ANTIMONY PAINT.

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GEORGE HALLETT & CO.,

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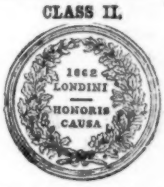


This Paint having been in general use over thirteen years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced or resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

The following Gas Companies in London have used the Paint for years—viz., The Gaslight and Coke, Imperial, Independent, City of London, Commercial, London, and Surrey Consumers.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

SPECIAL DRIERS FOR ANTIMONY PAINT SUPPLIED.

FRANCIS MORTON & CO., LIMITED, LIVERPOOL.

ESTABLISHED OVER A QUARTER OF A CENTURY.

ENGINEERS, GOVERNMENT CONTRACTORS, & MANUFACTURERS OF GALVANIZED CORRUGATED IRON ROOFS,

BUILDINGS, AND SHEDDING,

For which Estimates will be given on application,

ERECTED COMPLETE IN THIS COUNTRY

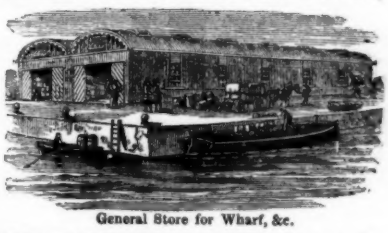
OR

PREPARED TO PLAN FOR ERECTION ABROAD,

EITHER WITH

TIMBER FRAMING or WHOLLY in IRON.

Open Shed for Covering Large Areas.



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GALVANIZED or PAINTED CORRUGATED IRON ROOFING PLATES and TILES. HEAVY CORRUGATED IRON PLATES for FIREPROOF FLOORS, ROADWAYS, PARAPETS, &c. WROUGHT-IRON TANKS, GUTTERING, and CONSTRUCTIONAL WROUGHT IRONWORK.

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WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

MANUFACTURERS OF ALL DESCRIPTIONS OF

FIRE GOODS, and Salt-Glazed Drain-Pipes.

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Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

M. SELIG JUNIOR AND CO.,

IMPORTERS OF

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WHOLESALE AND EXPORT MACHINERY MERCHANTS,

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THE "LIGHTNING" SCREW-PLATE.

It is warranted to do five times the work possible with any other screw-plate.

The threads cut with it are far more perfect than can be made with any other hand tool.

It finishes its work at one cut.

The dies are adjustable for wear.

Nuts and bolts threaded with it always correspond, without trying and matching.

THE CHASE'S PIPE-SCREWING AND CUTTING MACHINE.

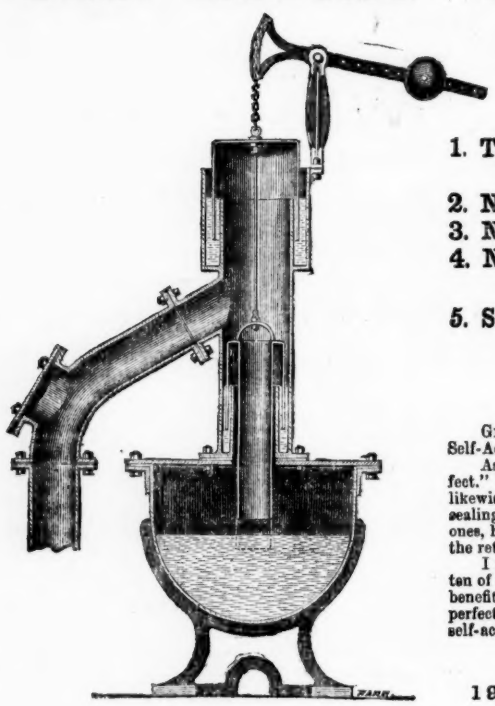
It threads, cuts off pipes, and makes nipples, from $\frac{1}{8}$ in. up to 2 in.

The Splitting of Pipe is entirely avoided.

SELF-ACTING REMOVABLE DIP-PIPE,

PATENTED BY

CHANDLER & STEVENSON.



ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

TESTIMONIAL.

Metropolitan District Asylum, Caterham, Surrey, Dec. 14, 1874.

MESSRS. CHANDLER AND STEVENSON.

GENTLEMEN,—I have much pleasure in bearing testimony to the complete working of your "Patent Self-Acting Dip-Pipes," which have now been in constant operation over three months.

As regards the action of the apparatus, I can describe it no better than by calling it "simply perfect." Immediately the retort is charged and the lid secured, the small holder rises, which lifts the Dip; likewise the instant the gas is permitted to escape at the mouthpiece the holder falls, thus perfectly sealing the Dip. I am fully convinced of the superiority of these Self-Acting Dips over Non Self-Acting ones, having experienced the fact that stokers do occasionally neglect to unseal the Dip after charging the retort, thereby causing a waste or loss.

I feel that it is quite unnecessary for me to say more on the subject, excepting that, having had ten of Messrs. Chandler's Dip-Pipes in use more than one year, and having experienced the great benefits derived thereby, inasmuch as the yield of gas from the coal is greatly increased, and the retorts perfectly free from carbon and other advantages, and seeing that the same Dip has been made perfectly self-acting by the second patent, I feel convinced that this is the right thing.—Yours obediently,

W. CRICKMAY, Resident Engineer.

For terms of use and cost, apply to Mr. G. W. STEVENSON,

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GAS ENGINEERS,

WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

METER DEPARTMENT.

They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

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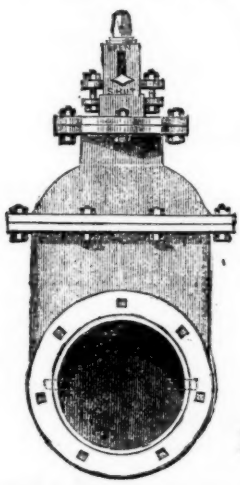
An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

☞ PLEASE NOTE THE ADDRESS–

GAS ENGINEERING WORKS, COMMERCIAL ROAD, EXETER.

C. & W. WALKERS' DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves are superseding the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

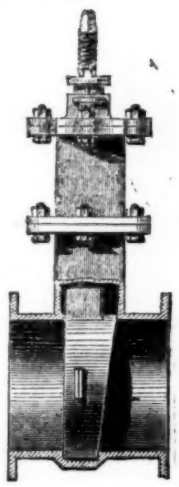
They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

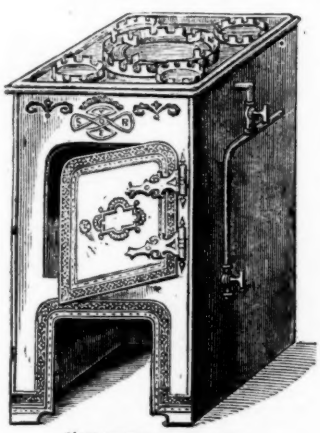
A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.



MIDLAND IRON-WORKS,
DONNINGTON, near NEWPORT, SHROPSHIRE;
8, FINSBURY CIRCUS, LONDON.



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No. 77.
18 in. wide, 36 in. high.
Hot Plate, 24 in. by 21 in. Price £5.

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FOR CULINARY AND DOMESTIC USE.

FOR EXCELLENCE OF DESIGN AND FINISH, COMBINED WITH GENERAL UTILITY AND EFFICIENCY, OUR GOODS ARE UNRIVALLED.

THE NEW REGISTERED "PARAGON" BOILING-STOVE

(From 2s. 3d. to 10s.)

IS THE MOST PERFECT ARTICLE OF THE KIND YET INTRODUCED.

PRICES AND TERMS ON APPLICATION.

WARNER AND COWAN'S
SELF-REGULATING GAS-METER,

PATENTED IN

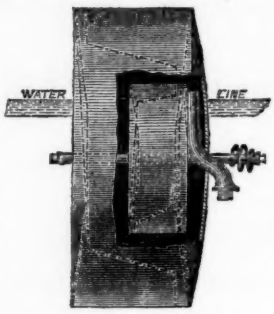
GREAT BRITAIN, FRANCE, AUSTRIA, PRUSSIA, BELGIUM, AND THE UNITED STATES.

OPINION

OF

W. RICHARDS, Esq., London, Inventor of the Dry Gas-Meter.

"Your improvement in the Wet Meter is decidedly the best that has been introduced since its invention; exceedingly beautiful and simple, which renders the instrument mathematically correct, and infinitely more accurate than any means in general usage for the measurement of liquids."



OPINION

OF

WILLIAM MANN, Esq., late Superintendent of the Chartered Gas-Works, Blackfriars, London.

"I saw a model of your Wheel to day,* and certainly think it the best addition that the Wet Meter has received since its invention, to ensure correct registration until the closing of the valve."

* Sept. 8, 1874.

From "THE JOURNAL OF GAS LIGHTING," Jan. 5, 1875.

"The changes effected in the construction of the wet meter are such that it now occupies a position which it never held before—that of an unvarying measure. . . . . Both company and consumer are now equally protected, perfect accuracy of measurement is obtained, and that, too, without the least increase of mechanism, or the action of the meter in the least degree being prejudically affected."

From "IRON," March 13, 1875.

"The construction of their meter is beautifully ingenious, and of great simplicity. All extraneous compensating arrangements are cast aside, the inventors having boldly attacked the measure itself, making it of fixed capacity in spite of a varying water-level. . . . . Thus this meter is the only one we know of with a fixed capacity. It is more stable in action, from the greater range of float, arising from the greater range of water-level, which the construction gives. Not only in a normal condition, but under varying circumstances, its registration is practically correct."

Opinion of THOMAS WHIMSTER, Esq., Engineer of Perth Gas-Works.

"When full, with 3 gills run off, and again with 7 gills extracted, the registration did not vary one-quarter per cent. I am thoroughly satisfied with your Meter, and will take the earliest opportunity of giving you an order."

Opinion of B. M. M'CRAE, Esq., Engineer to the Dundee Gas Commissioners.

"Surpasses anything that has hitherto been produced."

BRITISH ASSOCIATION OF GAS MANAGERS, Leeds, 1875.

Inaugural Address of the President, JAMES PATERSON, Esq., F.G.S., of Warrington.

"There are, however, degrees of what may properly be termed excellence; and this leads me to notice one of the most beautiful applications which science has yet devised in the construction of the meter, and which has rendered it an absolutely reliable and unvarying instrument. . . . . The object aimed at, and most admirably accomplished, is to change the varying measurement of a varying water-line to an unvarying measure with a varying water-line and annulus. Thus far the meter is proved to be highly satisfactory, and should the experience of a few years practical working sustain the expectations thus formed regarding it, it is likely to be brought into very general use."

From GEORGE ANDERSON, Esq., Consulting Gas Engineer, London.

"Found correct at the water-level, and also with 30 and 60 cubic inches of water withdrawn."

Mr. H. SPORNE, Meter Inspector to the City of London,

Referring to the lights, certifies, "Lights in each firm and steady."

Opinion of Dr. WALLACE, F.R.S.E., F.C.S., Gas Examiner for the City of Glasgow.

"I have no hesitation in saying that it is the most perfect Meter that has come under my notice. . . . . Such extremely accurate performance, combined with such an extensive variation in the quantity of water, leaves nothing further to desire in the measurement of gas."

THE PATENTEES ARE PREPARED TO GRANT LICENCES For the Manufacture and Sale of the above.

(A Licence for Great Britain has been granted to Messrs. J. and J. BRADDOCK, Oldham, and Licences for Austria and Prussia to Messrs. A. FAAS & Co., of Frankfort and Vienna.)

APPLICATIONS TO BE MADE TO

THE ORIGINAL LICENSEES AND MANUFACTURERS:

W. & B. COWAN,

ESTABLISHED 1827,

KING HENRY'S WALK,
BALLS POND ROAD,
(NEAR DALSTON JUNCTION STATION,) **LONDON, N.**

BUCCLEUCH ST. WORKS, EDINBURGH.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS,

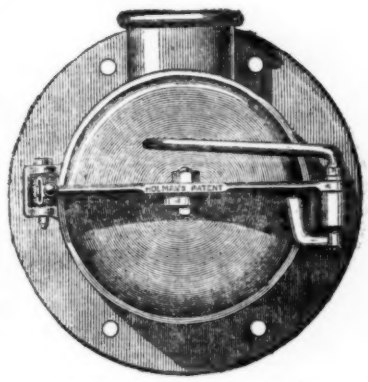
ANTI-FRICTION CATCHES, AND ECCENTRIC FASTENINGS.

NO LUTING.

NO DUPLICATE LIDS REQUIRED.

INSTANTANEOUS SEALING EFFECTED.

HOLMAN'S NEW SELF-SUSTAINING CROSS-BAR ENSURES FREEDOM OF JOINT AND MAINTAINS PARALLEL POSITION OF THE LIDS.



Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 15,000 being in use at various Gas-Works in London and the Provinces, among which may be mentioned:—

The Gaslight Co., Beckton (where, by the end of 1875, nearly 4000 will be in use).
" Gaslight Co., Bow Common.
" Gaslight Co., Silvertown.
" Gaslight Co., Lupus Street.
" London Gaslight Co.
" Independent do.
" Phœnix do.
" South Metropolitan Gaslight Co.
" Commercial do.
" Imperial do.
" West Ham Gas Co.
" Gas-Works, Barnet.

The Gas-Works, Royal Arsenal, [Woolwich.
" do. Lower Sydenham.
" do. Brentford.
" Consumers Gas Co., Woolwich.
" Alliance and Dublin Gas-Works.
" Edinburgh do.
" Manchester Corporation do.
" Salford do. do.
" Rochdale do. do.
" Liverpool Gas-Works.
" Birmingham do.
" Birkenhead do.
" Nottingham do.

The Newcastle-on-Tyne Gas-Works.
" Lurgan do.
" Carmarthen Gas-Works.
" Merthyr Tydfil do.
" Windsor do.
" Leeds do.
" St. Albans do.
" Over Darwen do.
" Rotherham do.
" Aylesbury do.
" Bournemouth do.
" Ystrad do.
" Cardiff do.
" Rochester do.

The Keighley Gas-Works.
" Aberdare do.
" Ballymena do.
" Richmond do.
" Stalybridge do.
" Longton do.
" Exeter do.
" Ross do.
" Falmouth do.
" Barrow-in-Furness do.
" Belfast do.
" Wakefield do.
And other Provincial and Foreign Gas-Works.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (Commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

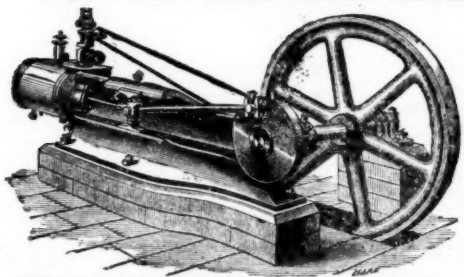
Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly,
(Signed) G. C. TREWEY.

TANGYE'S HORIZONTAL HIGH-PRESSURE EXPANSIVE

STEAM-ENGINES.



OVER 1300 SOLD SINCE THEIR INTRODUCTION IN DECEMBER, 1869.

In designing this Engine the utmost regard has been paid to simplicity of arrangement, strength of construction, and economy in cost. The working parts are considerably reduced in number, as compared with Horizontal Engines generally, rendering it far more durable and compact, the bed-plate, front cylinder cover, guides, and plummer-block for crank-shaft bearing being all cast in one piece, which in design and proportions is admitted by competent engineers to be perfect, and to afford a strength and rigidity that cannot possibly be attained in the best fitted engines of the ordinary horizontal type. The extraordinary stiffness of this Engine will permit of its being driven at a much greater maximum speed than engines generally, and with far less wear and tear. The cylinder with its valve-chest is bolted to the end of the bed. The cross-head slippers and connecting-rod ends are made adjustable, so that any wear can be readily taken up. The fly-wheel, cylinder-end, connecting-rod, and crank-plate, are all bright. All the parts are made to Whitworth's Gauges, and the material and workmanship are of the highest class throughout.

The Governor is of a very special description, and combines in the small space usually occupied by the ordinary steam stop-valve, a governor, throttle-valve, and stop-valve complete. It is exceedingly sensitive, simple, and compact.

These Engines are adopted in Gas-Works at Greenwich (Phœnix Gas Co.), Haggerston (Independent Gas Co.), Nine Elms (London Gas Co.), Falmouth, Harrow, Jersey, Plymouth, Richmond, Rochdale, Santiago (Chili), &c.

NUMBER NOMINAL HORSE POWER	B 2	C 3	D 4	E 6	G 8	H 10	J 14	K 18	M 25
Price of Engine, with Governor	£32	£38 15 0	£46	£70 0 0	£90	£115 0 0	£145	£185	£200
Feed-Pump, extra	3	3 15 0	4	5 10 0	6	7 10 0	8	10	15
Engine and Vertical Boiler on Base-Plate	75	95 0 0	110	150 0 0	180	225 0 0	289	—	—
Engine and Cornish Boiler, with Fittings	—	—	—	—	—	—	—	—	—
Variable Expansion Gear, extra	—	—	10	12 0 0	13	14 0 0	15	16	18

London 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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NOTICES TO SUBSCRIBERS.

Subscribers who desire to avail themselves of the reduction in the subscription to the JOURNAL by paying in advance for the second half of the year 1875, are reminded that this can only be done during the present month.

SUBSCRIPTIONS.

Yearly	21s. in advance.
"	25s. on credit.
Half-Yearly	10s. 6d. in advance.
"	12s. 6d. on credit.

Vol. XXV. (first half of 1875) will shortly be ready, bound in cloth, gilt letters, price 18s. Cloth cases for binding may be obtained on order from any bookseller, or from the Publisher.

All communications for the Editor, remittances for subscriptions, and orders for advertisements should be addressed to the Publisher, William B. King, 11, Bolt Court, Fleet Street, London, E.C.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JULY 20, 1875.

Circular to Gas Companies.

BUT little expectation can now be entertained that the Metropolis Gas Companies (Regulations) Bill will pass this session. Although the announcement made by the Premier, on Monday week, would seem to have deprived the promoters of their last hope, the Bill is still kept on the paper of business, and stands for recommittal on Friday next. It is impossible, at present, to estimate the chances of its being reached on that day. The "massacre of "the innocents" will shortly commence, and Government orders of the day will be fewer in number. There are, however, some important measures yet to be considered, which the Government cannot afford to sacrifice, and these will involve protracted discussions. But it is quite possible that, by some fluke or other, the Bill may be brought forward one night before half-past twelve, and it will require great vigilance on the part of the opponents to prevent this misfortune. It is essential that the Bill should be defeated in the House of Commons. Should, however, the promoters obtain a success in the Lower House, the session is too far advanced to allow of the measure getting through the House of Lords, without a wholesale suspension of Standing Orders. Under these circumstances, we think we may regard the Bill as practically lost for the present session.

The statement made by the Premier has been received by the promoters as a promise of success in the next session. Like many of Mr. Disraeli's utterances, this one is capable of two interpretations. To our minds, it gives no promise of Government support to the measure next year, but rather hints that the promoters must take their chance, as this year. As regards the appointment of a fresh committee, that will be at the discretion of the House, who may think it advisable that the case of the companies should be heard afresh; the more so, for the reason that the Bill now before the House is a very different measure from that opposed by the companies.

The Bill of the Commercial Company will probably pass. A Standing Order was suspended to allow of its being read a second time in the House of Lords last Friday, and, as yet, Lord Redesdale has not, so far as we know, made any objection to one-half of the new capital being raised by way of loans. Up to the present time his lordship has, for reasons known only to himself, sternly set his face against allowing a gas company to raise, by way of loan, more than one-fourth of the amount of share capital; and if he should acquiesce in the proposal of this Bill, he will show a deference to the opinion of a Commons committee, which he has never before exhibited.

We understand that all opposition to the Bill on the part of the Chartered Company has been withdrawn, and the only opponents now are the Imperial and some other metropolitan gas companies, and a body of consumers at the east end of London, where, notwithstanding all that has been alleged to the contrary, there is a chronic discontent with the Commercial Company. We doubt whether any of these opponents will do more than present petitions against the Bill, and these we do not anticipate will have the effect of stopping its progress. The directors of the Commercial Company have, of course, a perfect right to manage their undertaking in their own way; but we cannot help thinking that by so hastily adopting the provisions of the general Bill, they have, to a certain extent, betrayed the interests of their shareholders, while they have shown a complete want of that *esprit de corps*, which should have induced them to stand out with the other companies circumstanced like themselves under the Act of 1860. As it is, they have set a pernicious example, the consequences of which cannot be foreseen. They will most probably have the opportunity of making a year's experiment with 3s. 9d. and the sliding scale, before these provisions are forced upon the other companies, if they should be next year; and, as we have before hinted, they may be the first victims of the downward scale of dividend.

We regret the isolation of the Commercial Company for another reason. Seeing the temper of the authorities, and admitting the desirability of uniform legislation for the metropolis, it is certain that renewed attempts to obtain some general enactment will be made next year. But the recess will afford the companies the opportunity of arriving at a common understanding for the promotion of a measure by themselves, which, while making every possible concession to popular demands, shall secure their own just rights and interests. Such a measure, if conceived in a liberal spirit, and promoted with unanimity, would, we feel satisfied, obtain general acceptance. There are, further, the questions of amalgamation and possible eventual purchase by the authorities, which will, of necessity, crop up, and the terms of which can only be satisfactorily settled by united action on the part of the companies. We sincerely hope, therefore, that, before Parliament next meet, the companies will, by common consent, agree to the promotion of a measure such as we have above indicated.

Rather late in the day, the Chartered Company have issued a circular to their shareholders, calling upon them to exert their influence to prevent the passing of the Regulations Bill. The arguments brought against the Bill are such as we have all along employed, and will be as conclusive to shareholders as we think they ought to be to members of Parliament. If it were deemed worth while to send out such a circular at all, it should have been issued much earlier. In the present crisis, time is hardly left for individuals to communicate with their representatives.

At the last meeting of the Edinburgh Town Council, a formal proposal was made that the council should approach the two gas companies of Edinburgh and Leith, with a view to the acquisition of the undertakings by the Corporation of Edinburgh. No decision was come to on the occasion, the consideration of the proposal being remitted to the Provost's committee. We have

no doubt, however, that, in the end, negotiations with the companies will be attempted.

While on Scottish gas affairs, we may notice the fact that the Corporation of Arbroath have once more made a loss on their gas undertaking. Since they are charging their maximum price, 5s. 10d. per 1000 feet, they cannot raise the charge, so they have again to resort to a rate in aid. We have a strong objection to a rate in aid, which falls alike on consumers and non-consumers. The inaugural address of the President of the North British Association of Gas Managers, which we publish to-day, shows that our Scottish brethren are becoming more and more alive to the absolute waste involved in the supply of gas of the quality commonly distributed in Scotland. In Arbroath, for example, 28-candle gas is supplied, and we have little doubt that, as a consequence, the ceilings of the houses in which it is burned are as black as the roof of a Highland bothy.

An inevitable addition—not a very large one, it is true—has been made to the expenses incurred by the Corporation of Birmingham in acquiring the gas and water undertakings. Having, or being about to have, gas and water departments, it is necessary to provide accommodation for the officials, and this is to be done by the erection of new buildings, at an estimated cost of £7500. The mayor is shortly to move that two committees, consisting of eight members each, be appointed, one to manage the gas, the other the water undertaking. These committees will find themselves, at times, with a good deal of work on their hands, and the members must needs exhibit much public spirit if their labour is to be gratuitous.

So much of our space is just now occupied with parliamentary matters, that we had no room last week for a notice of the two important communications to the Gas Managers Association, which we published. Mr. Douglas's paper on the "Systematic "Testing of Meters" conveyed a practical recommendation, to which all gas managers should attend. We have often remarked on the folly, we may say the absurdity, of putting up a piece of apparatus, and of systematically leaving it until its defects cannot be overlooked. The true and proper plan, either in the case of meters or regulators to street lamps, is to ascertain, by periodical examinations, whether the apparatus is doing its work with accuracy or not. Mr. Douglas recommends that meters should be overhauled once in three years, and we perfectly agree with him. We shall not, of course, enter into a discussion of the relative merits of wet and dry meters. Admitting, with Mr. Douglas, that the wet meter is the more scientifically accurate instrument, we agree with Mr. Hartley that, whether wet or dry, the meter is an admirable machine, but it requires looking after. In the popular mind the meter is a mystery. The public do not understand its action, and many regard it as a juggle. The systematic periodical testings would, no doubt, tend to assure the public mind, no less than to satisfy the manager, who looks to the total registration to see the amount of his "leakage."

The paper by Mr. Cleland is one of the most valuable ever presented to the association. These are days in which it is especially necessary to practise economy, and the economy of force is the economy of money. We need not follow Mr. Cleland through all his details—first, the utilization of the waste heat from the retort-flues, for the production of steam, and the abolition of the steam-engine, the exhausting machine, and pumps, all superseded by the steam jet, so simple, so cheap, and so regular in its action. Mr. Cleland's method of using lime is a distinct novelty. We can understand the ease with which gas may be got through a purifier filled with lime nodules; but, without Mr. Cleland's assurance to the contrary, we should have doubted the effectiveness of the purification. This paper, we are certain, will be studied with attention, and all we now add is a recommendation to every manager who is likely to be engaged in the construction of new works, to make a trip to the Linacre works, at Liverpool, and see for himself the steam-jet exhauster and scrubber in operation.

The last quarterly report of Dr. Letheby, as chief gas examiner in the metropolis, again shows how faithfully the gas companies under his supervision fulfil their obligations to the public. In the all-important matter of illuminating power, the report shows that the average in each case is considerably, and, in one instance, largely, in excess of the statutory requirements. Marked improvement in sulphur purification continues to be shown; and this report exhibits little for the most captious to cavil at. Accidents will happen in the best regulated works, and, as we have often remarked, certainty in sulphur purification is not yet arrived at.

Water and Sanitary Notes.

All fear of a severe drought in the coming autumn is now removed, but at a terrible cost to some districts. The worst of a heavy flood is, that the mischief does not end with the immediate damage done. Damp foundations are a prolific source of disease, and disasters such as have been recently experienced are usually followed by much sickness. Sanitary science, in these cases, unhappily, suggests no preventive measures.

If a thing be worth doing at all, it is worth doing thoroughly and well. Lord Rosebery evidently believes in the truth of this maxim, and, accordingly, he moves to-day for returns which, if obtained, will afford most complete and valuable information as regards the disposal of sewage and town refuse. The notice of motion given by the noble lord is as follows:—

Return from every place in England, Wales, and Scotland having more than 5000 inhabitants, giving—

1. The name of place and number of inhabitants.
2. Method or methods by which the sewage and excreta are disposed of.
3. Method or methods by which the sewage is treated before reaching a stream, or is otherwise disposed of.
4. The name of the river or stream into which the sewage or manufacturing refuse is drained.
5. Description of the manufactures producing such refuse, and the estimated annual quantity of it.
6. The length of time during which any systems of sewage treatment have been in operation, stating also if they are at present in operation, and, if not, when they have been abandoned.
7. The total amount which has been expended in any works for treating sewage, distinguishing what portion has fallen on the rates.
8. The annual cost of carrying on such sewage works.
9. The annual profit, if any, derived from these works.

We may remark here that much of the information now asked for was given in a parliamentary return issued last year; but, as we said when noticing that document, the details were not so full as could be desired. The Government will, we hope, consent to the motion, for it will be of the greatest value to the various authorities who are now in perplexity as to what to do with their sewage. We have, it is true, some very good books on the sewage question. There are the admirable "Notes" collected into a volume by Dr. Letheby, which give us the scientific results of various modes of treating sewage, and the financial results also, to a certain extent. The Sanitary Committee of the Corporation of Birmingham also issued a very useful compilation of reports on the subject. There is, further, the somewhat one-sided report of the Sewage Committee of the British Association. Lord Rosebery's returns will constitute an interesting supplement to these works.

The Earl of Camperdown will not let the metropolitan water companies alone. He is to ask to-day—"Whether it is intended, "on each successive revaluation for parochial purposes, to confer "on the companies additional rating powers, without reference to "water supply." The power is already conferred, and, whether the water supply be in the hands of the companies or of the local authorities, it is certain to be exercised. The noble earl intends to ask further, whether it is proposed to prevent such power accruing to the water companies under the revaluation which will come into force next April. Only special legislation will prevent such power accruing to the companies; and we venture to think that none will be proposed. The Metropolitan Board of Works will hesitate to propose such legislation, because, when the perhaps inevitable day of transfer comes, they will want exactly the same power for themselves. It must be said, however, that a good deal lies within the discretion of the companies; and we believe we may say, without fear of contradiction, that, with respect to past revaluations, the majority have never exercised the powers they possess to the full extent. We may repeat our regret that the charge for water should be made in the shape of a tax, and not represent the value of the quantity consumed; but, at present, this is unavoidable. If Lord Camperdown can show the companies a better and fairer system, we are certain they would willingly adopt it.

The water accounts of the Corporation of Glasgow have been issued, and it is hardly necessary to say that they show a satisfactory state of affairs. The balance of profit on the year's working amounts to £25,115, which is carried, as usual, to the sinking-fund. At the present time, it is found necessary to make large additions to the existing means of bringing the water from Loch Katrine, which will entail heavy expenses. We are glad to see that the Corporation are now making efforts to stop the enormous waste of water which goes on in Glasgow. They have formed one waste water district, with highly favourable results, the consumption having been reduced to one-half of what it previously was. This should encourage the Corporation to carry out Mr. Deacon's plan still further, for, although it may render them somewhat unpopular with their consumers, they may possibly, in the end, save the necessity of further extensions of the works, in connexion with Loch Katrine, for many years.

Testimonial to Mr. R. Harvey.—On the occasion of his retirement from active duties on Monday evening last, Mr. R. Harvey, late carbonizing foreman to the London Gas Company, was presented with a purse containing over £20, contributed by the men employed on the works, as a token of their high regard and esteem for him. Mr. Harvey has been in the company's service for over 40 years, and is now in the enjoyment of his well-earned pension.

Correspondence.

VARIATIONS IN ILLUMINATING POWER.

SIR,—I have pleasure in verifying the statement of "C. T.," in your issue of the 6th inst., as to the variations evidently not caused by the quality of the gas, but by inequalities in the flame of the candle.

I have occasionally found the latter to be the case when using gas (as I always do) direct from a 5-feet standard holder, before passing it through the test-meter and governor.

There is an advantage in this mode of operation, as the accuracy of the meter can be tested before and after the experiment is made, without disturbing any part of the apparatus.

The holder is, of course, emptied of its contents, and filled from the mains for each experiment.

I think, even if these precautions were taken, Mr. Young would still occasionally find the variations he mentions.

GEO. GOLDSMITH.

Leicester, July 10, 1875.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, JULY 12, 1875.

The Birmingham Corporation Water Bill was reported, with amendments.

TUESDAY, JULY 13.

The LORD CHANCELLOR acquainted the House that the further Standing Orders applicable to the Commercial Gas Bill have been complied with.

THURSDAY, JULY 15.

The Oldham Corporation Water, and Birmingham Corporation Gas Bills were read the third time with the amendments. Further amendments made, and bills passed.

The Earl of CAMPERDOWN gave notice that on Tuesday, July 20, he would ask whether it is intended, on each successive revaluation of the metropolis for parochial purposes, to confer upon the metropolitan water companies additional rating powers without reference to the water supply; and, if not, to ask how it is proposed to prevent such powers accruing to the water companies under the revaluation which will come into force in April, 1876.

Lord ROSEBERY gave notice that on Tuesday, July 20, he will move for the following returns:—Return from every place in England, Wales, and Scotland, having more than 5000 inhabitants, giving—1. The name of place and number of inhabitants. 2. Method or methods by which the sewage and excreta are disposed of. 3. Method or methods by which the sewage is treated before reaching a stream, or is otherwise disposed of. 4. The name of the river or stream into which the sewage or manufacturing refuse is drained. 5. Description of the manufactures producing such refuse, and the estimated annual quantity of it. 6. The length of time during which any systems of sewage treatment have been in operation; stating also if they are at present in operation, and, if not, when they have been abandoned. 7. The total amount which has been expended in any works for treating sewage, distinguishing what portion has fallen on the rates. 8. The annual cost of carrying on such sewage works. 9. The annual profit, if any, derived from these works. The return to be classified in counties; the name of each place to be in alphabetical order.

FRIDAY, JULY 16.

COMMERCIAL GAS BILL.—On the motion of the CHAIRMAN of COMMITTEES, the order of the 23rd of April last, relating to private bills, was dispensed with in respect of this bill, which was then read a second time, and committed. Petitions against, were presented from (1) The Imperial Gaslight and Coke Company, (2) Phœnix Gaslight and Coke Company, and Surrey Consumers Gas Company, (3) Consumers of gas within the district supplied by the Commercial Company, (4) Consumers of gas and others.

HOUSE OF COMMONS.

MONDAY, JULY 12, 1875.

GAS AND WATER ORDERS CONFIRMATION BILL (LORDS).—This bill was considered in committee and reported, without amendment. Re-committed for Tuesday, July 13. The petition of the Corporation of Hull against the Newington Water Order was withdrawn.

METROPOLIS GAS COMPANIES BILL.

Petitions against this bill were presented from Stalybridge Gas Company; George F. Muntz; Surrey Consumers Gas Company (two); Croydon Commercial Gas and Coke Company; George Butterworth; Durham Gas Company; Woolwich, Plumstead, and Charlton Gas Consumers Company; Torquay Gas Company; William Sanders; Great Berkhampstead; Charles Barton; Bristol United Gas Company; Stuart Adolphus Moore; Henry Miles; Thomas Maughan; Alfred Barton; Andrew Grant; George Wilson; J. Ekins; Thomas Boulton; Winchester Water and Gas Company; Crystal Palace District Gas Company; Barnet District Gas and Water Company; and Worcester New Gaslight Company.

The committee was deferred till Wednesday, July 14.

CONSPIRACY AND PROTECTION OF PROPERTY BILL.

The House having gone into committee on this bill,

Mr. LOWE moved to omit in clause 4 the words "where a workman is employed by a municipal authority or other public body to," &c., and to insert "where a person is legally bound and is able to perform any duty, the immediate and probable consequences of the neglect of which would be to deprive the community of a supply of gas or water, or shall expose property of the value of £100, or endanger human life, such person, if he abandons that duty without reasonable excuse, shall on conviction," &c. He said he did not propose his amendment in a spirit at all hostile to the bill. He adopted all that the Home Secretary proposed to do, and only wanted to extend the principle further. He had little doubt the Home Secretary would agree to that principle. All he asked was that this general principle should be applied in three cases with reference to the supply of gas or water, or the exposure to destruction of valuable property, real or personal, and he would add to these placing in jeopardy human life; but without limiting the offence to any breach of contract, or making it applicable to workpeople at all. Wherever a man's duty was by contract or otherwise to supply water or gas, if he abandoned it without reasonable excuse, depriving a municipality of a supply of water or gas, or exposing valuable property to destruction, or endangering human life, he should be punished, whether he was a workman or not. He might be a contractor—a man entering into a contract to do certain repairs—and by his neglect or wilful default some great catastrophe occurred; he did not know why that man should be exempted from the consequences of his misconduct, although he was not a workman. He hoped the right honourable gentleman would see this matter as clearly as he himself saw it. It would be a great thing to teach working men that they were not a class apart, to be treated in a different manner from others, but that what they did for or against them they were willing to do for or against themselves if they fell into a similar fault. He wished to establish that principle, and to give it a larger application in the case of the Criminal Law Amendment Act, giving the working classes thoroughly to understand that they should be treated with the most perfect equality and justice.

After some conversation on a point of water, the amendment was reduced to this form—to leave out "workman" and insert "person."

Mr. CROSS quite admitted the general principle the right honourable gentleman had laid down, that it was always wise, if possible, to have a general instead of a particular law; but persons who were brought under a particular law must not fancy they were singled out because of something objectionable in them or their calling. The simple explanation was, that the relation to the public they had undertaken required special legislation, which did not affect others, and there were numerous instances of persons occupying such relations who had never felt or suggested that special legislation was a grievance. It often happened that persons belonging to special classes, if they committed certain offences, required to be punished either with more or less severity on account of the position they occupied, which might impose upon them greater responsibilities; and if the law were generalized, so that all persons should be subjected to equal punishment for like offences, hardships might be inflicted much more grievous than any that were removed. He must therefore oppose the amendment.

Sir W. HARCOURT said the only question before the committee was whether the clause should be applied to everybody or only to workmen. It was said that it was desirable in the public interest that persons who had duties to perform in connexion with gas and water works, and who wilfully and maliciously broke their contracts, should be liable to certain penalties; but why not say that all persons whose duty it was to supply gas and water should be punished in a similar manner, instead of speaking only of workmen? Suppose the coal merchant or the coalowner broke his contract, and did not deliver coal, and the consequence was a town was not supplied with gas, why was the workman who did his work to go to prison and the coalowner not?

Mr. ROEBUCK said a coalowner could not wilfully or maliciously break his contract. How could it be proved that a coalowner who did not supply coals did it maliciously? It was easy enough to prove the wilfulness and malice in the case of the workmen who went away all at once from their work with the intention of throwing a town into darkness.

The ATTORNEY-GENERAL said the difficulty was not in the substitution of the word "person" for "workman," but arose upon the subsequent amendments of the right honourable gentleman. The object was to deal with a specific evil and case of misconduct relating to the supply of gas and water, and where the breach of the duty would lead to the most lamentable consequences.

Mr. DODSON thought that when any person engaged in these works was under an obligation and broke it, then, whether he was an overseer or workman in the employment of the gas company, he ought to receive equal treatment.

Mr. CROSS said there could be no possible objection to substitute the word "person" for "workman," if the clause were not to be extended beyond those who were bound by some contract. He therefore assented to the amendment, on the understanding that he was not to be led into the snare provided by the right honourable gentleman in the rest of his amendment. The overseers and others in the employment of the company ought to be just as much bound by their contract as the workmen.

Mr. FORSTER hoped the Home Secretary would so far alter the clause as to make it applicable to all persons who broke a contract for supplying a town with gas or water.

The clause was then amended by the substitution of the word "person" for "workman."

Mr. LOWE thought the words "employed by a municipal authority" had no meaning. Why was it worse to break a contract where a municipal authority or public company were concerned than in other cases where there might be no Act of Parliament? If those who undertook the duty violated it, what did it signify what particular form of municipal government or organization existed? He moved to leave out the words "employed by a municipal authority," and insert "on whom is imposed the duty."

Mr. CROSS said the object in view would be secured by the adoption of the amendment of his honourable friend behind him (Mr. Tennant)—namely, the insertion of the words, "or who, under any charter of incorporation or otherwise, have assumed the obligation" of supplying gas or water. That amendment he was prepared to accept.

Sir W. HARCOURT observed that there were many populous villages which had no municipal authority, but which were supplied by companies to whom the general Act did not apply. The Act ought to be made wide enough to embrace those companies.

The SOLICITOR-GENERAL said that if the amendment were adopted, one great object they all had in view would be defeated, as workmen employed by gas companies, who conspired together and left their work at a moment's notice, would not be reached by the clause.

Serjeant SIMON suggested the insertion of words which would make the clause applicable to all persons bound by contract, whether of service or otherwise.

Mr. CROSS said he would not object to amend the clause by making it applicable to persons employed by a municipal authority or public company, or by any company or contractor upon whom was imposed by Act of Parliament the duty, or had otherwise undertaken the duty, of supplying gas or water.

Sir H. JAMES suggested that the clause should be worded to the effect that if a person wilfully and maliciously broke a contract, the non-performance of which would do injury to the inhabitants of a city, borough, or town, he should be liable to punishment.

Mr. CROSS thought the adoption of the suggestion would be an uncalled-for extension of the Criminal Law.

Mr. HARDCASTLE hoped the committee would adhere to the clause as it stood. He thought the adoption of the amendment would be an excessive extension of a penal statute.

Sir W. HARCOURT said the opposition had no more desire than gentlemen opposite to extend the Criminal Law on Contracts. The great grievance that they were endeavouring to remedy by this legislation was that working men felt they were subject to exceptional legislation.

Mr. CROSS said he thought it would be a great misfortune if a political element were introduced into the discussion. He denied that the present bill could in any accurate sense of the word be described as class legislation. It was simply legislation arising out of the relations borne by certain persons, who were not workmen, to the public. The clause had simply been inserted in the bill in order to avoid the danger to the public which might arise from the action of these persons.

Mr. W. E. FORSTER said he failed altogether to see why the same law should not be applied to workmen and to those who, employing workmen, undertook to do certain work for the public.

Mr. MUNDELLA saw no reason why workmen should be subjected to a penalty from which their employers were to be exempted.

Mr. WALTER agreed in thinking that both gas and water companies and their *employés* ought to be held responsible for their neglect, but as he understood the honourable and learned member for the University of London, and the honourable and learned member for Sheffield, they wished to extend the responsibility to the persons who supplied the companies with coal or other materials necessary to enable them to carry on their business operations. He, however, thought the clause should not be strained so as to extend to third persons, but should be con-

fined to the companies whose duty it was to supply the public with gas and water, and to their servants.

The Marquis of HARTINGTON thought the clause as proposed to be amended would not include the coalowners who supplied the gas or water companies with coal. He denied that there was a desire on that side of the House to extend the criminal law to contracts of various descriptions to which it had not previously applied.

Serjeant SIMON contended that a person who wilfully refused to perform a contract of any kind entailing such consequences as were pointed out in the clause, and did so knowing what the effect would be, ought to be criminally liable, whether he were a workman or not.

The committee then divided. The numbers were—

For the amendment	108
Against	127
Majority against the amendment . . .	—19

The amendment was therefore lost.

On the motion of Mr. CROSS, the words "or by any company or contractor" were inserted after the words "public company."

Mr. LOWE then moved the omission, in line 9, after "contract," of the words "of service," so as to make the clause applicable to contracts generally, and not merely to contracts of service.

On a division the amendment was negatived.

Mr. CROSS moved an addition to the clause, requiring a printed copy of the section to be posted up in some conspicuous place at the gas or water works of the municipal authority, or public company, or company, or contractor carrying on such works, under a penalty not exceeding £5 for each day default, and inflicting a penalty not exceeding 40s. on any person unlawfully defacing or covering up such a copy.

The clause, as amended, was agreed to.

The other clauses were gone through and settled, and some new clauses were inserted.

TUESDAY, JULY 13.

The Lords amendments to the Manchester Corporation Water and Improvement Bill were agreed to.

The South Staffordshire Water Bill (Lords) was reported, with amendments.

On the motion of Sir C. FORSTER, the order of the 2nd of March, "That the Gaslight and Coke Company's Bill be read a second time," was read and discharged, and the bill was withdrawn.

METROPOLIS GAS COMPANIES BILL.—Petitions against this bill were presented from the Imperial Gas Company, Charles Barstow, Folliott Sandford, and John B. Massey.

GAS AND WATER ORDERS CONFIRMATION BILL.

The House went into committee on this bill.

Two new clauses were proposed in the Newington Water Order, for the protection of the Corporation of Kingston-upon-Hull.

Mr. DODDS did not think that they ought to consider an important measure of this kind without having the amendments, which it was proposed to insert, on the paper. He therefore moved that the chairman should report progress.

The motion was agreed to, and progress was reported. Committee to sit again on Wednesday, July 14.

WEDNESDAY, JULY 14.

METROPOLIS GAS COMPANIES BILL.

Petitions against this bill were presented from Chichester Gas Company; Woolwich Equitable Gas Company; Wandsworth and Putney Gaslight and Coke Company; Richmond Gas Company; Bath Gas Company; Falmouth Gas, Coal, and Coke Company; Horsham Gas Company; and Sheffield United Gaslight Company.

The committee was further deferred till Friday, July 23.

GAS AND WATER ORDERS CONFIRMATION BILL.

This bill was recommitted, and on the motion of Sir C. ADDERLEY the following clauses for the protection of the Corporation of Kingston-upon-Hull were inserted after clause 29:—

"30. Notwithstanding anything contained in this order, it shall be lawful for the Corporation of Kingston-upon-Hull (in this order called 'the corporation') to exercise all powers, rights, and privileges vested in or enjoyed by them for the suppiy of water, and to lay down water mains and pipes, together with all necessary works and conveniences connected therewith, within the limits of supply, and from time to time to take up, remove, and repair such mains or pipes, or any mains or pipes belonging to them within the limits of supply, and to lay down others in lieu thereof as fully and effectually as if this order had not been made, and this Act had not been passed; and it shall not be lawful for the undertakers to interfere with or obstruct the corporation in any manner in the exercise of such powers, nor to take, use, or interfere with the mains and pipes belonging to the corporation, or any of them, without the previous consent of the corporation in writing under their common seal, and the undertakers shall pay and make good to the corporation any damage or injury that may be sustained by them, and all costs and expenses that they may incur or be put to by or in consequence of or resulting from any interference by the undertakers with the said mains and pipes, the same to be recovered by the corporation with full costs against the undertakers in any court of competent jurisdiction."

"31. Nothing in this order contained shall extend to prejudice, diminish, alter, or take away, any of the rights, privileges, powers, and authorities now vested in, or used, exercised, or enjoyed by the corporation; and all their rights, privileges, powers, and authorities may be had, exercised, and enjoyed to all intents and purposes as if this order had not been made."

The bill then passed through committee.

THURSDAY, JULY 15.

METROPOLIS GAS COMPANIES BILL.—Petitions against this bill were presented from Portsea Island Gas Company and Liverpool United Gas Company.

FRIDAY, JULY 16.

METROPOLIS WATER SUPPLY AND FIRE PREVENTION BILL.—The second reading of this bill was deferred till Friday, July 23.

HOUSE OF LORDS COMMITTEE.

WEDNESDAY, JUNE 16.

(*Before Earl* DEVON, *Chairman; Earl* NELSON, *Viscount* HUTCHINSON, *Lord* CARYSFORT, *and Lord* CLONCURRY.)

GAS AND WATER ORDERS CONFIRMATION BILL.

(NEWINGTON WATER ORDER.)

Mr. POPE, Q.C., Mr. BIDDER, Q.C., and Mr. WEBSTER appeared for the company; and Sir EDMUND BECKETT, Q.C., for the Corporation of Hull, who petitioned against the application.

Mr. BIDDER, in opening the case for the promoters, said this was an application to authorize the construction of certain works in the districts of Newington and Newland, suburbs of Kingston-upon-Hull. Down to the year 1843 Hull and its neighbourhood were supplied with water from natural springs at a place called Springhead; but as the town increased in size and population the springs, as it was then thought, were found to be inadequate to the demand for water, and the corporation applied to Parliament for increased power. Hitherto they had supplied the town under a charter which dated as far back as the reign of Henry VI.; but the corporation were advised by engineers, who did not seem very wise in their day and generation, that the natural source at Springhead would fail them. In 1843 Parliament granted powers by which the corporation were enabled to draw a sufficient supply from the river Hull; but when the people came to drink the new water they found it largely impregnated with sewage. The complaints on this head became so loud that in 1860 or 1861 the corporation were forced to go back to Springhead, it having been discovered in the meantime that the only reason why the corporation had not before obtained water there was because they had not sunk any wells. Following the advice and example of a gentleman who had at his own expense made borings at Springhead, the corporation, after getting through a flint bed, found an enormous quantity of water, which they conveyed through a long line of pipes to their reservoirs. But the reservoirs not being covered, the water fermented during storeage, and was sent out to the people in what might be called a parboiled condition. Of late years there had been many complaints, too, from the inhabitants as to the Springhead supply—not of its insufficiency in itself, but of insufficiency because the corporation had not provided sufficient storeage room. The people of the Newington district, who were pecuniarily interested in the Provisional Order, scarcely knew how to get water. A great deal, he believed, was stolen from the North-Eastern Railway Company's pumps. The district had of late years greatly extended, and therefore the water supply was, and had been, a question of considerable importance. In the dilemma application was made to the Corporation of Hull for assistance, they having powers, under their Act of 1872, to supply water outside their district. After some hesitation they agreed to supply water on conditions which were certainly onerous and exorbitant. They demanded no less than 1s. 6d. for every 1000 gallons supplied, or a sum equal to 15 per cent. upon the rental of the houses in the district, and besides that the district had to pay for all mains and supply-pipes. It was Hobson's choice with the people; they must either take the water from the corporation or go without. The corporation entered into an agreement with the districts of Newington and Newland to supply them for three years, determinable by the corporation in 14 days in the case of Newington, and three months in the case of Newland. Finding the terms very onerous and inequitable, Mr. Garbutt, a landowner of considerable enterprise, purchased a piece of land in the neighbourhood of Hessle, made borings, laid down pipes, and from that service the districts of Newington and Newland had been supplied for some time past, at a rate of 5 per cent. on the rental of the houses, instead of 15 per cent., as charged by the corporation. The water was abundant in quantity, and excellent in quality; but the whole responsibility being greater than a private individual was capable of undertaking, a limited liability company was formed, and application was made to the Board of Trade for a Provisional Order, which, after a report from Captain Tyler, was granted, and the company now applied to Parliament to confirm that order. It was surprising, he thought, that any one could be found to raise any objection to the application; but the Hull Corporation, who were frequently found in that House as opponents to bills, had thought proper to do so. Their chief objection was that the new works would withdraw water from their source of supply; but he was at a loss to know how that could be, since the area was of the same geological stratification—viz., chalk, and yielded an inexhaustible supply of water. In addition to that, it had been laid down by their lordships House, in the great case of *Chasemore and Richards*, that no one could hold property in subterranean water. Under those circumstances he contended that the Hull Corporation had no right to be heard upon this application, and he asked the committee to decide upon that point.

Sir E. BECKETT, in arguing the question of *locus standi*, referred to certain passages in a speech made by Mr. Webster, when the matter was before the Board of Trade, which he read, as admitting the right of the corporation to appear in committee, and that being so, he maintained that the promoters could not now object to their being heard.

Mr. WEBSTER explained to the committee that he did not intend his words to carry the interpretation which had been put upon them.

Mr. BIDDER having been heard in reply, the committee decided that under all the circumstances they would admit the *locus standi* of the corporation; but they wished it to be clearly understood that they did not believe there had been any breach of faith on the part of the promoters, in reference to what took place before the Board of Trade.

The evidence in support of the statement of the learned counsel was then called, and occupied the whole of the two following days.

MONDAY, JUNE 21.

Sir E. BECKETT addressed the committee in opposition to the order. He admitted that the water-works of Hull had not hitherto been a profitable concern. How were they to become profitable? Only in the ordinary way—partly by good management, which the corporation were trying to secure, and partly by the gradual increase of the demand for supply. That was the source to which all railway, water, and gas companies looked for profit in the first instance, and his argument gained additional strength when, as in the present case, the water supply was in the hands of the corporation, and associated with the government of the town, as the Duke of Richmond's commission said it ought to be wherever possible. Another strong ground of opposition was that the pipes of the Hull Corporation actually passed through the district of Newington and Newland at the present moment, and all that was required to be done to make the Hull supply available would be the laying down of supply-pipes from time to time.

Mr. BIDDER said that the petitioners only contention was that, if their lordships confirmed the Provisional Order the company would, upon the strength of their parliamentary powers, hereafter demand an exorbitant price for their works when the corporation came to purchase them. Supposing the works cost only £5000, that would be perfectly immaterial to the present matter, as the standard by which the price of the property would be tested would be its value as a going concern. One of the advantages Newington and Newland were to derive from the Hull water supply was a participation in the £40,000 which they were already under contract to expend. Upon their own confession, the corporation had squandered £7000 or £8000 a year in waste and extravagance. Hitherto they had had the borough rate to fall back upon; but that was now exhausted within £7000, so that another year's mismanagement would just work it out. The question was whether the districts of Newington and Newland were to be left in their present precarious position as to the water supply, trusting to private works without parliamentary powers, and having no alternative but the corporation water at 1s. 6d. per 1000 gallons, until such a time as the corporation might choose to annex them.

The CHAIRMAN asked how they would be better off with the confirmation of the order than they were at present.

Mr. BIDDER said that at present there were no rights between the promoters and the consumers, excepting by agreements. Supposing a consumer did not pay his rates, the company would have to bring an action for the recovery of them; but if the Provisional Order were confirmed, they would have power, under the general Act, to recover by summary process. At present they were only in the position of traders, who had entered into an agreement with the local authority to supply the district with water, and the remedy against consumers was expensive and circuitous. The learned counsel, in concluding his argument, wished their lordships to remember, on the side of the public, that whilst in their present condition the company were at liberty to make any dividend they could realize, if the Provisional Order were granted the dividend would be limited to 10 per cent.

The room was then cleared, and, on the readmission of the parties,

The CHAIRMAN said: The committee is prepared to confirm the order, subject to one point. We are not satisfied with clause 12, which provides that the water supplied by the undertakers shall not be delivered at a greater height than by the existing works. We desire to see that clause altered, so that it may read that water shall be delivered at a height equal to the highest storey of any existing house.

Mr. BIDDER pointed out that the object of the committee would be accomplished by striking out the clause altogether; for then the general Act would come in and make that pressure imperative.

The CHAIRMAN was then directed to report the bill, as amended, to the House.

MONDAY, JUNE 21.

NEWPORT (MONMOUTHSHIRE) GAS BILL.

Sir EDMUND BECKETT, Q.C., Mr. GRANVILLE SOMERSET, Q.C., and Mr. MICHAEL appeared for the promoters; Mr. BIDDER, Q.C., appeared for the Alexandra Dock Company, and Mr. UNDERDOWN for Lord Tredegar, who were petitioners against the bill.

Mr. SOMERSET, in opening the case for the promoters, said it appeared that the bill was to authorize the Newport Gas Company to construct further works and to raise additional capital to buy the reversion in fee of certain land held under Lord Tredegar, and to purchase certain other lands. The company were in this fortunate position—that they stood there unopposed on the question of money, price, and management. Neither was there any doubt of the absolute necessity of an increased supply of gas, and of the necessity for further lands for that purpose. Within the last ten years Newport had increased 50 per cent. in population and houses, and between 1869 and 1874 the supply of gas had increased from 67 million to 87 million cubic feet per annum. The Alexandra Dock Company opposed the bill on the ground that there was plenty of land available without taking that which ran alongside their property; but the answer of the promoters was that all such land was unsuitable for the purposes of gas-works. That the learned counsel said was the simple position of the case.

The following evidence was then taken:—

Mr. *Thomas Gratrex*, chairman of the Newport Gas Company, examined by Mr. MICHAEL, said the promoters had expended nearly £50,000 upon their works, and it was very desirable they should have the reversion in fee of the premises they now held—about an acre and a half—under Lord Tredegar, who was the owner of nearly all the land in Newport. They were constructing a large tank on the freehold part of their works at an ultimate cost of £7500. Their present works were about two miles from the Alexandra Docks, and there was a large population along that distance requiring gas. The company were under contract to supply a large quantity of gas to the Alexandra Docks. Unless they could rearrange their works, the difficulties of supplying the town would become very great. It had been estimated that the new works would cost about £40,000, and the company would be very glad to meet the views of the Alexandra Dock Company and of Lord Tredegar if they possibly could. He could not see how the new works would injure the property of either of the petitioners.

Cross-examined by Mr. BIDDER: To the north of the gas-works a very large population was springing up, which they would have to supply. One reason for desiring a division of the works was, that there was now in their low position a difficulty in getting a sufficient pressure. On the west of the works there was a large piece of land, principally garden ground, but it was very rising land, and therefore inconvenient. Messrs. Cordes had told him that they could not spare the land, as they wanted it for their own works. There were about 40 acres of marsh land belonging to the corporation within a short distance of the gas-works, but there was the objection to it, that it was sometimes covered by the tide.

Mr. BIDDER: Does it not strike you that, in taking the land next to the dock company's premises, you are taking the very throttle of all these railway lines which will run into the place, and that it is about the most inconvenient spot you could have selected out of the whole of the dock company's 600 acres?

Witness: I always understood that the eastern curve would never be made.

Mr. BIDDER then read a letter of the general manager of the Monmouthshire Railway Company (of which Mr. Gratrex is a director), in which it was stated that it would be absolutely necessary for the connexion of their system that the branch should be made.

By Mr. UNDERDOWN: About six years ago witness wrote a letter to the late Lord Tredegar on the subject of the gas question, but he got no answer. It was true that they had not made any application to the agents of Lord Tredegar to modify the conditions under which they carried on the works.

Mr. *Edward J. Phillips*, deputy-chairman of the gas company, and a director of the Alexandra Dock Company, examined by Mr. MICHAEL, said the whole of the authorized capital of the gas company had been, or was in course of being, expended; indeed, they had spent £1649 in excess of their share capital. The increase of houses and population between 1851 and 1871, the time of the last census, had been at the rate of 55 per cent., and in consequence of the construction of the dock the increase was likely to be much larger in future, especially in their neighbourhood. The proposed new site of the gas-works was the most eligible in every respect. He did not believe that those works would in any way interfere with the lines of the dock company. The tendency of the increase of the population would be in the direction of the new docks. The dock company had laid out plans, from which it would be seen that they themselves were preparing for a very large increase in the population; they were laying out streets on some portion of the 200 acres and other land belonging to Lord Tredegar. There was no room for further extension on the present site of the gas-works. There were reasons why the proposed gas-works should not interfere with No. 6 Railway. The Alexandra Dock Company, in laying out their plans, were very careful to avoid interfering with those lands by their works. The directors of the gas company had carefully considered the question of the eligibility of other land in the neighbourhood, and the conclusion they came to was that none would do so well as that they had now chosen. He did not think it likely that the dock company would want the land for marshalling traffic. He had never heard of marshalling at a junction.

By the COMMITTEE: The directors of the dock company were not unanimous in opposing this bill, inasmuch as he was one of them, and a witness for the promoters. If he thought any injury would result to the dock company, he would certainly have opposed the bill.

Cross-examined by Mr. BIDDER: He was nominated to a directorship of the Alexandra Dock Company by the Monmouthshire Railway Company. That company had certainly not put itself in opposition to the dock company. The Monmouthshire Company did oppose a bill for enabling the dock company to grant a lease of their undertaking, and they did so because it would not be for the interests of the Monmouthshire Company that the docks should go into the hands of an antagonistic company. It would be a very dangerous thing to have a gas-main passing over a railway. Last year one of the mains, owing to an engine passing under it, took fire, and there was the greatest difficulty in preventing the bridge from being burnt down. They did not consider that the proposed works on the new site would be a nuisance to the town. He really did not think the sidings could be made on the site proposed for the new gas-works.

By Mr. UNDERDOWN: The gas company had laid down only about 200 yards of pipes, but they were proceeding to lay them down the whole distance to the Alexandra Dock. Looking to the town, and the rapid increase in the population, if the company did not do something the place would be in darkness next winter, as it would be impossible with their present works to supply the town with gas three years hence. His own idea was that they would require six acres of land to carry out their new works. It was clear that the Alexandra Dock Company were not disposed to give them any land out of their 200 acres, as repeated applications had been made by different people for wharf land, and so on, but up to the present time no answer had been given to any one.

TUESDAY, JUNE 22.

Mr. *E. J. Phillips* was recalled, and further cross-examined by Mr. UNDERDOWN respecting the various sites that had been inspected for the new works, and as to his connexion with the Alexandra Dock Company.

Mr. *Thomas Canning*, examined by Mr. MICHAEL.

I am engineer to the promoters, and have been in their employment since March, 1874. The area of the present works is 1 acre 3 roods and 20 perches, and this includes sidings and a portion of the freehold land upon which we are at present erecting gasholders. We have 115 retorts, 15 of which, having served for more than four years, are worn out, though we were obliged to use them last winter in order to keep up the supply. We were then very much pressed, and on one occasion ran quite short of gas. We were obliged to use the whole of our available manufacturing power, which is exceedingly dangerous in the conduct of a gas-work, where there ought to be at the very least sufficient to supply the maximum consumption, and 20 per cent. for reserve and repairs. The largest amount we have been able to make in any one day was about 370,000 cubic feet, and we have supplied 420,000 cubic feet. Our consumption is increasing, and we are likely to want a good deal more, because at the present moment we are extending our mains through the town. We are laying a very large main, but no more than will be necessary, as we have had many complaints from remote parts of the town of the want of a supply of gas. Those complaints are, in my opinion, very justly founded, and the company are doing all they can to meet them. On our freehold land we are erecting a gasholder and tank of 100 feet in diameter, it will be telescopic, and will contain something like 350,000 feet. Our present storeage power is 200,000 feet. We require about 40 or 45 additional retorts in order to meet the supply likely to be required next December. I am informed we have not power to pull down certain constructions that I would remove, and so as we stand we have not space to erect a single additional retort. Our purifying and scrubbing apparatus is all crowded together; in fact, in the construction of a purifying-house last summer we were obliged to carry the wall over the piers of the gasholder on a cast-iron girder. Owing to our limited space we are most decidedly not conducting our works in such an economical manner as I would desire in the interests of the consumers. It would be impossible to continue to make and supply gas from our present works alone. For works of this size the proper make of gas per acre of land would be about 200,000 feet. More could be done on larger works and less on smaller, but for works of our size that would be the full quantity. Speaking from a consumers point of view, it is most decidedly desirable that we should have an extended space in order to make gas economically, because if we go on supplying gas from our present works we shall have extra leakage, as we require extra pressure in order to send gas to the consumers. Our works are not favourably situated for supplying the bottom part of the town, where the dock lies. The site for the new works would be exceedingly advantageous in that respect, as it is situated in the immediate neighbourhood where gas is required both to the right and left. I have heard there is some ground in the vicinity of our works, but I do not consider it suitable. I do not know, to begin with, whether there is sufficient of it; and, in the second place, it is highly inclined ground, and I consider that the cost of clearing away the land and erecting a boundary fence would be £6000 or £7000, which amount of capital must be expended, and would be perfectly useless. I have here a diagram [produced] showing our condition with respect to producing, purifying, and storing power from the year 1855 to the year 1874. There was a very large increase during those years. In 1869 the quantity of gas sold was about 67 million feet, last year it was over 87 million feet, showing an increase of 20 million in those five years. The proposed new site is in every respect suitable for the erection of gas-works, in order economically to supply the district. We propose to expend something over £20,000 on our present works, on the holder and tank, and the mains connected with it. The new works on the additional site would take about £50,000 more; that will make a total of £70,000. It will take some two or three years, perhaps longer, to construct the new works. Supposing we had the present site in fee, so that we could rehabilitate and improve the old works. I should say we should be able to do it so as to a great extent to meet the most pressing wants of next year. If we had free control over the present works we should develop them to supply say 500,000 cubic feet, which is the demand I fully expect next winter. We are obliged to provide for our largest day's consumption, which always occurs in December. We are compelled by Act to provide a supply of gas for all persons who demand it.

Cross-examined by Mr. BIDDER: When our new holder is erected two of the old holders will be taken down, in order to extend our retorts, and this will reduce our storeage power. We also require the old retort-house and the gasholder adjoining pulled down, so as to extend the retorts, and if we had power to do so we should be able to put up 48 additional retorts, but as the pulling down would do away with 15, our total number would only be 145. It is not possible to rearrange our railway communication without destroying it, which I should not recommend. [Witness was then cross-examined, by means of plans, to show that by a rearrangement of the existing works they could be made sufficient for the supply required.] We are lighting new districts, and as some of the people are not sufficiently supplied, we are increasing the size of our mains. The increase in the maximum daily consumption since 1864 has been about 120,000 cubic feet. Forty-five additional retorts would increase our producing power something like 40 per cent.

Mr. BIDDER: Am I wrong in saying that the increase of producing power, by putting up these retorts, would be equal in per centage to the increase during the last ten years of the maximum consumption?

Witness: Yes, because you have not taken into consideration the facts which I have put before you—namely, that we have had to increase, and are increasing, our supply at present to the town, that our present means of supply are not equal to the demand, and that we have increasing demands which are much greater than any we have ever experienced before.

By the COMMITTEE: The opening of the new docks and other things taking place in Newport will increase the demand so much, that what we have done in the past will be no rule whatever to go by for the future. Supposing we carried out our old works as I now contemplate, we should do no more than bring the producing power up to the maximum demand at present, and that is the outside we could do.

Cross-examination continued: Our storeage power requires increasing, because we are at present working with 50 per cent. storeage—a most unsafe thing to do. If we pull down the two little holders and put up the large one, we shall have a storeage capacity exceeding the largest day's consumption we have ever known, but not anything like what we expect. We could not, with those holders, supply the town for the whole 24 hours without making a single foot of gas, as we should then plunge the whole town in darkness the next day. It is about two miles to the remotest place we now supply, but we expect to go another mile, perhaps three miles. Three miles is an exceptional

length of main when it is tapped and drilled all along by the supply-pipes. From the land alongside our present works, there are about two acres of land which the company might have. If we had that we should double the area of our works, but without benefiting ourselves very much, because in some years to come we should be applying for fresh powers to get land elsewhere. My idea is that we should get six acres of land somewhere, and that would last for ten years perhaps, and when we came for a fresh bill for capital, we should have land without the necessity of looking for it. Besides all this we should be enabled to concentrate our works. It would be much more economical, because from our present works we may have to lay down a main to supply the bottom of the town of twice the diameter we should want, if the works were immediately adjoining that part. That ground, too, is highly inclined, the top portion being about 23 feet above the level of our present works, and not quite 200 yards off. I know the marsh land, but do not at all know how many acres there are. I certainly should never think of going there for erecting works, it is quite at the wrong end of the town for the supply of gas. I do not think it is within the resources of engineering, without spending plenty of money, to make a good foundation on those marshes, and on a place like that it would be waste of money. One of the reasons why we selected the site we did was its proximity to the railway; another, that we might be at the usual parliamentary distance from the houses in the neighbourhood. There is a piece of land, at present unoccupied, down towards the sea. It is very remote, but if driven there I should not object to having it. There would be some difficulty about the communication, which is of great importance. I considered it would be requisite, and contemplated having a siding into the proposed site, but we have given up that part of the scheme altogether. I have not had experience of the amount of sidings a large mineral dock requires.

By the COMMITTEE: An expenditure of from £45,000 to £50,000 upon the new site would give an increased power of about 500,000 cubic feet per day that would last over about 10 or 12 years.

By Mr. UNDERDOWN: With regard to the adjoining ground I am not aware my company took power over it in 1856, and subsequently abandoned it. My objection to it is the expense to which we should be put excavating and carting the earth away, and building a boundary wall round it. The road between the old works, and this sloping ground is one leading to the Dos Works; it does not go beyond.

Re-examined by Mr. MICHAEL: It is the way they take all their traffic, and they have no other way as far as I am aware. If we had had an opportunity, we could have supplied a very much greater quantity of gas in 1874. We were obliged to slacken the pressure under which we supplied gas to the town. It has been one of the greatest difficulties we have had to contend with. Our supply has increased from 67 to 87 millions in five years, which is about 33 per cent. I have no doubt whatever we shall go on increasing at least at that ratio when we have a more abundant means of supply. That is almost a standing rule for the majority of works, and I consider ours will be no exception.

Mr. *Charles B. Fox*, solicitor, of Newport, gave evidence as to the conditions under which the Alexandra Docks Company acquired the land adjoining its property, from Lord Tredegar. He gave it as his opinion that the dock company, having made a substituted railway for Railway No. 5, had exhausted their rights, and that the land reverted to Lord Tredegar.

Mr. *Thomas Hawksley*, examined by Mr. MICHAEL.

I have been consulting engineer to the Newport Gas Company for a great number of years. I know the position of the existing works, and on the 20th of February last I carefully examined into their condition. They are practically exhausted in their manufacturing power, and the whole of the site is used to the fullest extent that is reasonably possible. About 200,000 cubic feet of gas per day is the most that can be properly made upon an acre of land. In the works everything is completely crowded up; there is not sufficient room for coals, coke, apparatus, and other stores. Usually, in busy towns, whether commercial or manufacturing, the gas-works duplicate in about nine years, often in eight. That rule would apply to Newport. The company's maximum daily supply last year was 420,000 feet, and they were only able to make 320,000 feet—that is not a proper condition for the works to be in, as they are then obliged to depend upon gaining something upon Sunday, in order to get up stock. In small works there should be a reserve of retort power to the extent of 20 per cent., in very large ones 10 per cent. There ought at Newport to be 15 per cent., as there the works are medium sized. The additional ground proposed by the petitioners is separated by a road from the existing works, and is rising ground, which is not so suitable by any means as a level. It would involve a large expenditure of money before it could be used, as a great deal of excavating would have to be done. It is desirable to go to the lowest part of a town to give the supply, and the new site proposed to be taken by the promoters is very suitable. In the interests of the docks and of the houses round, it is particularly desirable that any new works should be placed at the opposite end of the town to what the present works are. If all the works are in one place, the mains must be sufficient to carry the whole of the gas from one end of the place to the other, but if works are placed at the opposite ends of a town, the mains have only to be of a size to carry half the quantity, and so there is a more equal distribution. I do not think the quantity of land asked for—five or six acres—too much, looking at the prospective increase of the consumption. From recent experience we are obliged now to make much larger provision as to storeage than was the case some years ago. For instance, we are greatly influenced by strikes, and have to provide for many thousand tons of coal in winter, in order to prevent the manufacture being stopped for want of the gas-producing material. The storeage in the old works is very small indeed. Altogether, in the interest of making cheap and good gas, it is desirable Newport should be supplied by the adoption of the new site, and I so advised when I was on the spot. It is a common matter of advice with me to recommend, in the interest of economy and uniform distribution, that two works, when the town is considerable, rather than one, should be established. Supposing it carried out with an expenditure of some £40,000 or £50,000, it would be to the advantage of the gas consumers.

By the COMMITTEE: I know something of the gas supply of Cardiff. At one time they there doubled their supply in six or seven years. That was about 10 years ago. What they are doing now I cannot say. The increase at Cardiff then was something prodigious. At Swansea, as far as I remember, they doubled their supply in less than nine years.

Cross-examined by Mr. BIDDER: I agree with Mr. Canning, when he says he can, as a possibility, raise the producing capacity of the old works 20,000 cubic feet a day, but it could not prudently or properly be done, because the maximum yield of the works is now greater than it could be fairly estimated at. And then he must have larger stores for his increased supply of coal and make of coke; so that although it is quite possible, by ingenious contrivances, to make more retort power, one could not make all the other areas agree. The land in the vicinity of the old works rises 30 or 40 feet in a very short distance. It is not merely a question of expense to make this ground suitable. It is in a densely populated part of the town. Under the Standing Orders of the House there would be very great difficulty in acquiring it, for notices would have to be given to all the owners, lessees, and occupiers within 300 yards, and all of them would have an opportunity of opposing. Besides that the corporation would object to any extension of the works in that direction. I know the marsh land previously referred to. There is no doubt gas-works might be built upon it if it could be acquired, and of course all the pipes leading from those works could be connected with the existing works, but it would involve all the mains through the town being enlarged. That often happens when a town increases, but it is not desirable—in fact, it is economical to put another work at the opposite end of the town. I had no part in the selection of the new site proposed by the company. It is particularly eligible, being in the neighbourhood of a large and increasing consumption, and in communication with the railway, so that coals could be got with great facility. The former of these advantages it shares with some hundreds of other acres, and if we had the power of selecting a site, and then changing it if it were objected to, I should say that those hundred acres would be open to us, but the Standing Orders compel us to make a selection and stick to it; there is the difficulty. The peculiar advantage which distinguishes it from the scores of acres in the neighbourhood is the proximity of the railway. Parliament does not usually grant compulsory powers to take land for gas-works against the will of the owner, though there are two circumstances which have led them to concede those powers in certain cases. Firstly, when the land is adjacent to the existing works; and, secondly, when the land in the neighbourhood is held by one or two large proprietors; so that, practically, there are no means of selecting sites which do not interfere with those particular persons. Compulsory powers are not unfrequently given in the cases of railway and water companies. To a certain extent it is true that the business of a gas company can be carried on almost anywhere. I believe Lord Redesdale usually, but not invariably, reports adversely to compulsory clauses of this kind. Gas-works have been deemed, rightly or wrongly, to be obnoxious neighbours, and on that account the Standing Order originated, and Lord Redesdale has been very indisposed to grant compulsory powers. But here is a case where the works could not be objectionable to any one, because the whole neighbourhood is dedicated, by reason of the railways and docks, to commercial and manufacturing purposes. If there were hundred of sites I should say the gas company were imprudent in the selection of this one; but when, as happens in this particular case, the hundreds of sites are practically reduced to one or two by reason of the way in which the land is held, of course it makes no difference, if you keep away from importantly occupied buildings, whether the land be taken by compulsion or not. I am unable to give a single precedent to justify what is proposed to be done in this case.

Mr. UNDERDOWN: In one of the exceptions you gave to the granting of compulsory powers, you alluded to occasions when a large portion of the adjoining land belonged to large owners. Now I will ask you whether in the course of your investigations you were informed there was any indisposition on the part of Lord Tredegar to grant such a site?

Witness: No; on the contrary, I rather understood that Lord Tredegar was not indisposed to sell land, for in point of fact all the land was on sale for one purpose or another. It is not residential property. When I visited Newport Lord Tredegar was too ill to be personally communicated with on the subject. He had been written to, but no answer had been returned.

Mr. *John Warren*, a civil engineer of Newport, said he had prepared the deposited plans, and they were correct. He was not responsible for selecting the site.

Mr. *George Harrison*, general manager of the Monmouthshire Railway Company, said the site was not one on which he should imagine sidings ought to be made inasmuch as it was a junction, and junctions ought always to be kept free. But however that might be, there would be room for seven lines of rails outside the retaining wall of the gas-works.

Mr. *Alfred Henshaw*, traffic manager of the Brecon and Merthyr Railway, said that after a careful consideration of the question, he was ready to affirm that the site of the proposed new gas-works was not a proper or desirable one for railway sidings.

Mr. MICHAEL said that concluded the case for the promoters.

Mr. UNDERDOWN then addressed the committee on behalf of Lord Tredegar. He said it was with extreme reluctance that his lordship came forward to oppose any scheme which might seem to have for its object the improvement of the town of Newport. As to the proposition that the company should become freeholders of the land now held under lease, he had to say that no application had ever been made for permission to modify the works, or such permission would have been given. But he must object, on the part of Lord Tredegar, to any change of relationship between himself and his tenants; no advantage could accrue from it, and great disadvantage might be the result. The notice to take this land was sprung upon the agents of Lord Tredegar with much surprise; and, as showing the perverse ingenuity with which the bill had been conducted, he might mention that in the scheme as originally deposited it was actually proposed to take a part of Railway No. 5.

Mr. MICHAEL said it was known very well it was for the purpose of making a siding.

Mr. UNDERDOWN continued: Even admitting that to be so, he thought that to come and ask, for the purpose of private enterprise, for power to construct a siding on land including the petitioners own railway, was unheard of, even if the property were required for the most useful and necessary object. He maintained that Parliament ought to look at any application which gave power to take land against the will of the owner with extreme caution. Lord Tredegar had been very careful not to grant any applications for land until he was perfectly satisfied that such grants would not interfere with the general arrangement in regard to traffic to and from the docks, which had been opened comparatively but a few weeks.

The room was then cleared, and, on the readmission of the public,

The CHAIRMAN said the committee did not require any evidence as to the proposed new site, but upon the application of Mr. Michael they consented to a clause giving power to the gas company to purchase the land by agreement. The objection of the committee, the chairman said, was to compulsory purchase.

WEDNESDAY, JUNE 23.

Mr. BIDDER, referring to the decision of the committee the previous day—not to grant compulsory powers to the promoters to take the land selected for the new site of the gas-works—stated that he was now instructed to say that, whilst the dock company were desirous of meeting the promoters in every reasonable way, nothing on earth would induce them to give up the piece of land in question for any purpose whatever, it being, in the opinion of his clients, absolutely needed for railway sidings.

The CHAIRMAN said the committee had already decided not to grant compulsory powers.

Mr. BIDDER replied that he understood so; but, as the land could not be parted with under any circumstances, it would be superfluous to insert a clause giving power to purchase under agreement, which clause, moreover, might hereafter be made the ground for a future application to Parliament for compulsory powers.

Mr. UNDERDOWN said that he, on the part of Lord Tredegar, was at one with the dock company in this matter.

The COMMITTEE then proceeded to hear evidence on the branch of the case relating to the proposal to purchase the reversion in fee of a certain piece of land belonging to Lord Tredegar, upon which a portion of the existing works now stand.

Mr. *Henry J. Davis*, agent of Lord Tredegar, was called to prove the conditions under which the lease was held from Lord Tredegar. The unexpired term, he said, was 49 years. His chief objection to the purchase of the reversion in fee was, that in such an event the gas company would have power to stop access to other property owned by his lordship. He could not see how the acquisition of the freehold would benefit the gas company, unless they obtained with it the

power to purchase land leased by Messrs. Cordes. In his experience he had never before heard of a lessee coming to Parliament to purchase the land he held. Something had been said about the transfer of land being a benefit to Lord Tredegar personally, but he might say that his lordship's action in this matter had not been suggested in the slightest degree by any personal motives.

Mr. *Fox* was recalled on the part of the promoters. He said that, in 1856, a right of way across the private road held by the gas company was granted to the Dee Company by arrangement, and the right would not in any way be affected if the leasehold were changed into a freehold. The gas company would purchase the reversion subject to that right of way. He could not give, of his own knowledge, any instance of a lessee coming to Parliament and asking for powers to change a leasehold into a freehold; but he should think it was an every-day occurrence.

Mr. MICHAEL then addressed the committee on behalf of the promoters; after which the room was cleared for the deliberation of the committee, and, on the readmission of the public,

The CHAIRMAN announced that the committee had come to a resolution that it was not expedient to pass so much of the bill as sought to obtain compulsory powers for dealing with land held under lease by the gas company and by Messrs. Cordes.

The only remaining portions of the bill were those relating to powers to raise additional capital. The several clauses were agreed to without opposition, and the bill, as amended, was ordered to be reported.

HOUSE OF COMMONS COMMITTEE.

WEDNESDAY, JUNE 23.

(*Before the Right Hon.* W. E. FORSTER, *Chairman; Mr.* S. B. BRISTOWE, *Mr.* J. G. TALBOT, *Mr.* T. BRASSEY, *and Mr.* H. BIRLEY.)

METROPOLIS GAS COMPANIES BILL.

(*Continued from page* 69.)

Serjeant SARGOOD said, in reference to a remark by the honourable member, Mr. Bristowe, on the previous Monday (see JOURNAL, July 13, p. 65), he had looked at the accounts, and found that it was not the Chartered Company who were responsible for raising the £800,000 of share capital at 10 per cent. to almost the full extent of their capacity, and not raising one farthing by loan, as mentioned by the honourable member. The circumstances were these. The Western Company not being an incorporated company, could of their own motion create any amount of capital that they chose, and could of their own motion exercise any amount of borrowing powers that their own shareholders decided upon. The assumption that the Chartered Company had devolving upon them the power to raise the £600,000 of capital was erroneous. Before the Western Company amalgamated with the Chartered they had raised that capital, and issued it at 10 per cent.; but there remained to be called up £180,000. The Chartered Company had nothing to do with the terms on which it was issued; they had only the option of calling up, or abstaining from calling up, the odd £180,000 still outstanding. With regard to the borrowing power, it was not a borrowing power that devolved upon them *simpliciter*, by means of amalgamation, that they could have exercised in the same way, or delayed until any time they thought fit. It happened to be a borrowing power which was specially created at the Chartered Company's request within a very few days of the amalgamation, at the very half-yearly meeting which was called to approve the Act of amalgamation. The circumstances that led to it were these. Two previous companies, who had been amalgamated, and whose amalgamation was sanctioned either by direct Act of Parliament or by the Board of Trade, were to receive a preference dividend of 10 per cent. upon their capital to the detriment of the ordinary shareholders, who had to stand by. When it was proposed to amalgamate with the Western Company, the Western Company asked for a preference capital; the Chartered Company hesitated about doing that, and it became a matter of arrangement, that if the amalgamation was carried out the outstanding £180,000 of the Western Company should be called up before any new capital of the Chartered Company was issued, to the advantage of their own shareholders. They could not govern the rate of dividend upon the capital that had already been issued by the Western Company. They said to them, "We will call it up for your own advantage before we call up any more of our own; but we will only do that on this condition, that you must convey to us at the same time, in the interest of the public and of the company, a right to get a larger amount of borrowed money than we now possess; and as you have, of your own motion, the right to borrow, we will undertake to call up your capital in the first instance, if you at your next meeting, when you approve of the amalgamation, will reserve to us the right to borrow to the extent of one-third of that capital, a sum of £200,000, at 4½ per cent., our power only going to the extent of a quarter of our capital. But though it was a matter of arrangement that the calling up of the already issued stock should be the first initiatory step, as a fact the very next step the Chartered Company took was to raise the whole of the £200,000 loan, and it was all raised and expended between the 1st of January and the 31st of March in the following year. In the report of the Revision Commissioners of 1874, this was referred to as having been done in the interest of the consumers; and he begged the committee not to forget that that £200,000 never could have existed but for the special pressure which the Chartered Company put upon the Western, to create the power in order to transfer it to them.

Mr. George W. Wadbrook, examined by Mr. WEST.

I am a valveman at the Beckton works, and take testings on behalf of the Chartered Company. The testings are taken every two hours, and sometimes 2½ hours, for 12 out of the 24 hours. When we have taken the testings, we leave the average to be made out by the chemist for the 24 hours. When the illuminating power is below 16 candles, I give information to the foreman to use cannel to bring it up, and we have a holder served with a superior quality, so that we may mix it, as it takes two or three hours to bring it up to the mark. I keep my eye upon the jet photometer, and record the illuminating power according to that test.

Cross-examined by Mr. PHILBRICK: The gas is tested about every two hours, and the results are written on strips of paper for the chemist to take down in a book, and our names are signed to each of the tests. I am the person responsible for the accuracy of the tests. In order to work up to the test of the referees, I have to see that we are burning 5 cubic feet an hour at a certain pressure. We have meters specially for the purpose in the test-room. We have also telegraphic communication from our works to all of our stations, to give notice as to everything concerning the works. If the illuminating power should drop below what it ought to be, it would be the duty of the person in charge of the telegraph to give notice of it, and orders would be given to put cannel into the retorts to bring it up to the standard. We look at the jet photometer four or five times in an hour. There are 10 observations with the photometer, and we have found the illuminating power vary slightly between the first and last, but it does not vary much—not more than a quarter of a candle. If the gas does get below the standard, assuming there is a brisk consumption, by opening the holder with the superior quality in it, it will alter in about half an hour.

Re-examined by Mr. WEST: If I were to see that the illuminating power varied two candles during the 10 minutes, I should think there must be some error in the instrument.

Mr. *Frederick Beale*, examined by Mr. BROUGHTON.

There are two modes of testing—viz., by the jet photometer and by the bar photometer; the former is a rough means for the workmen to go by, and the bar photometer is more accurate. The jet photometer is tolerably accurate—within half a candle. I have heard the evidence that the illuminating power can be altered, to the extent of two candles, in 10 minutes, and I am quite certain it could not be so.

Cross-examined by Mr. PHILBRICK: With works of large magnitude, such an alteration would be impossible. I have seen the charge of a retort entirely drawn, and the retort filled with cannel, to increase the illuminating power, and the improvement takes place in about two hours. The more retorts you empty, the quicker you see the alteration.

Re-examined by Mr. WEST: There are between 3000 and 4000 retorts at Beckton; and were it possible to empty them all and charge them with cannel, the rise in the illuminating power could not be very sudden, even then.

Mr. *Frederick John Evans*, examined by Mr. WEST.

I am a civil engineer, and was one of the three gas referees originally appointed by the Board of Trade under the City of London Gas Act of 1868. I resigned in June, 1870, and am now a director of the Chartered Gas Company. I think the Act of 1868 was a good scheme for the protection of the consumers, and worked well while I was a referee. I was formerly engineer-in-chief to the company. The Beckton works cover a very large extent of ground; the works alone stand upon 150 acres, and were originally built to make 10 million feet per day. We have a very large pier, 800 feet long, running into the river, turning at right angles, so that the steamers can lie alongside; and we have an apparatus for unloading the coal into railway trucks running on the pier. The railway is continued into all the retort-houses, so that we unload the coal from the ships into those houses, by which means we are enabled to get the coal in a fresh state. We do not have to store it, by which a great saving is effected in the quantity of gas per ton, as it enables us to get from 50 to 60 feet a ton more than we should if the coal were put into the stores. Within the last three or four years we have gone on increasing, in consequence of our amalgamations with other companies, and also owing to the great demand from the natural increase of gas lighting. We have doubled the works, as far as the manufacturing power is concerned; in fact, we have now in use, or shall have at the end of the year, eight retort-houses, which will make 20 million feet per day; and, in addition to that, we have two more houses in progress, which will enable us to make 26 million feet a day altogether; so that we are in a good position for meeting all the increased demand for gas. I should think the works will be finished in 1876. By these means we are enabled to do away with the manufacture of gas at Goswell Street, Curtain Road, Blackfriars, and to a great extent at the Westminster station; and I expect, by the end of this year, the Westminster station will cease to manufacture gas, so that we shall have done away with four stations in the heart of London. We purify gas at Beckton by the use of lime, which adds considerably to the expense, but improves the gas very much by reducing the amount of sulphur. It is impossible to use that method of purification in a densely populated district, the smell being so offensive that we should be indicted if we used it. All the stations are subject to the rules of the referees for the purification of gas; but the gas made at Beckton is required to have 5 grains less sulphur. The other stations are allowed 20, Beckton 15, and that increases the expense of our production very much. I should think, at the present time, about 40 to 50 acres of land are covered by our works. When our Beckton works are completed we shall be in a position to supply the other companies in bulk, if they apply to us to do so, having laid out our ground with that object. There is no doubt we could manufacture a very large quantity of gas in addition to our own wants, which would obviate the necessity of other companies increasing their manufacturing works in the metropolis. The object we had in view in purchasing the land was for our own purposes, there being no amalgamation contemplated at that time. Supposing the other companies under the existing Acts of Parliament were to amalgamate with the Chartered Company, we should be able to supply them with gas from the Beckton works. The Act of 1868 gives us the power to do it, and we should be in a position to do it. It would not, in my opinion, require nearly as large an expenditure of capital by us to supply them in bulk with gas as it would require for them to build new works. We have the ground and the pier, and everything to carry on the works, and it would only be a question of plant. Such a proceeding would, there is no doubt, be a very great economy to the whole of the metropolis. We have found a considerable saving from the amalgamations which have already taken place. Take the City for example; there were three companies mains there, but since the amalgamation has taken place a very large number of those mains have been taken up, and the whole of the supply is now being given by one set of mains. The effect has been to prevent a very large amount of leakage, and that, of course, represents so much saving. The leakage has been reduced from 16 per cent. down to about 9 per cent. I recollect the time when it was 23 per cent. I do not think it can be very much lower, because it is not all gas lost through the leakage of the mains. The greater part of it is unaccounted-for gas—that is, from defective meters, and storeage, and that sort of thing—but the mere leakage itself I do not think is much more than 4 or 5 per cent. We supply both cannel and common gas, and therefore our leakage is greater in proportion than it would be if only one kind were supplied. The whole of Westminster, St. George's parish, and St. James's parish have two sets of mains. We have absorbed the Great Central and the City of London companies.

Mr. CRIPPS objected to the line of examination, and stated that, beyond the fact of the amalgamation having enabled them to work cheaper, he did not think the evidence ought to be gone into.

Mr. WEST contended he was right in his examination.

The CHAIRMAN said he understood that the point was agreed upon that the powers of amalgamation were not to be interfered with.

Mr. CRIPPS said not in the general bill, but when they arrived at the bill for the amalgamations, that would be the time to go into the question.

Mr. WEST said, after Mr. Cripps's statement, he would not pursue the question further.

Cross-examined by Mr. CRIPPS: Of course, upon our large outlay of capital, we are looking for future profit in coming years. A considerable portion of the land we have bought is unproductive now, but we propose to remove some of our stations to that land, and also to meet extensions, and when that is done, we shall have land much more valuable in London to dispose of; in fact, Blackfriars station has been sold, and is being pulled down now. It was disposed of to the Corporation of London for £170,000; and we have expended £50,000 upon the purchase of lands at Beckton. This concentration of the works at Beckton will produce economy, and will enable us to supply gas cheaper. The difference per ton in the cost of coal between Beckton and our Westminster station is as much as 4s. per ton; but the great advantage to us at Beckton is having the coal fresh; we do not store it, and so are able to get more gas from it than we otherwise could. I did not say we had taken up the old mains and put new ones in their places; I said we had taken up the old ones, and made one set do for the two or three sets which were there previously, thereby saving the leakage, which was a considerable drain upon our resources; and, undoubtedly, whatever we save, will enable us to supply gas cheaper for the future. For the manufacture of common gas, we use about 6 per cent. of cannel. I know that in Mr. Field's book the proportion of cannel used by the Imperial is put down at 3 per cent., but they supply about three candles less than we do.

Mr. CRIPPS: If you look at the Act of Parliament, you will find two candles difference.

Witness: I think you will find it so in fact, but we cannot give our illuminating power without the per centage I have mentioned.

Mr. CRIPPS: That is exactly what I thought you would say. You see the Imperial at one time since their Act passed required 7 per cent. of cannel, which they have since reduced to 6, then to 5, and now to 3 per cent.: while, to enable you to produce your illuminating power, your proportion is 6 per cent. Can you say what additional expense over gas made entirely of Newcastle coal 3 per cent. of cannel would entail—would it not be somewhere between a farthing and a halfpenny?

Witness: It may be so.

Re-examined by Mr. WEST: I attribute the greater use of cannel by the Chartered Company to their having to deliver gas of a higher illuminating power.

Mr. WEST: Is there not another reason for it? Are you aware that the Imperial Company use Wigan cannel and you use Hucknell cannel? Is it not the fact that Wigan cannel produces a greater amount of illuminating power than the Hucknell cannel, and therefore the company using the latter will have to use more in proportion than the company using the former?

Witness: Yes.

Mr. WEST: Does it answer the company's purpose better to use Hucknell cannel or Wigan cannel?

Witness: We use it partially, but not entirely; we use Scotch cannel generally.

By Mr. CRIPPS: Scotch cannel is better than Wigan in some cases.

By the CHAIRMAN: I was chief engineer, and designed the Beckton works, and then I was elected a director of the company.

The CHAIRMAN: There is the fact that your working expenses are very much higher than the average—can you tell me why they are so? The average in 1873 is 33·59, and yours is 36·92. In 1869 your company by itself is 37·03, and the average is 29·75; and it goes on very much in the same way.

Witness: Of course I do not know how these tables are made. We are the only company which unload the coals ourselves. Most of the coals supplied to the different gas companies are unloaded by the ship.

The CHAIRMAN: It can hardly be that, because your price of coal is so much more than the other?

Witness: No; I think you will find it less.

The CHAIRMAN: Perhaps it is the cannel which makes it so.

Witness: It is; there are 90,000 tons of cannel used in the year, and some of it is 25s. to 30s. and 40s. per ton. The Western Company made nothing but cannel gas; but there is nothing made at these works now but common gas. Some of the consumers in that district liked the change; others did not, and want to go back to the old plan; but, as a general rule, they are satisfied with the gas they receive. Some say it is quite as good as it was when it was cannel gas. I consider 16-candle gas is quite sufficient. I believe many of the consumers are paying less for the gas now than they did before, and they are quite as well satisfied with the light.

By Mr. TALBOT: The gas consumed in the streets is the same as is supplied to the public, but the local authorities have reduced the quantity consumed.

By the CHAIRMAN: The lamps in the Western district used to be supplied with cannel gas. We do not hear many complaints about the meters being out of order. We have inspectors who go round every quarter and take the indexes, and they leave a statement at the house.

Mr. *John William Field*, examined by Mr. WEST.

I have been accountant for the Chartered Company since June, 1873, and prepared the accounts for the revision of 1874. My attention was specially called by the commissioners to the amount of unaccounted-for gas, the result being that further works were carried out to reduce that item as much as possible. In 1872 the unaccounted-for gas was something like 17 per cent. on the whole quantity made; in 1873, on the common gas the per centage was 13·2, and in the following year it was reduced to 9·3. In 1874 the actual results show an increased make per ton of coal of about 750 feet as compared with the estimate we laid before the Revision Commissioners, which effected a saving of 36,755 tons of coal in that year. Supposing we had not had the revision, our dividend upon the ordinary shares in 1873 would have been under 3 per cent., and in 1874 we should have paid no dividend whatever, and have only been able to pay part of our interest upon the debenture debt. The Metropolitan Board of Works said that the then existing form of accounts did not give them sufficient information, and the commissioners, in the memorandum attached to their award, stated that they agreed with the Metropolitan Board that certain information should be given in addition to that already supplied, and Mr. Parkes, the official auditor, with the consent of the Board of Trade, has made all the alterations they required. As to the comparison of cost of manufacture between the Chartered Company and the other London companies, it is quite impossible to make a satisfactory comparison, arising from the fact that the Chartered Company are supplying two qualities of gas. In the manufacture of common gas we use 6 per cent. of cannel, and in the manufacture of cannel gas about 36 per cent. of cannel coal. In 1873 we used a great deal more than that; but last year may be taken as a normal year. Some of the coke from the cannel coal is entirely worthless; we use a great deal of it for mending the roads on the works. Our revenue from coke is affected from the company's principal works being at a great distance from London, though that is improving at present. When the price of coke was very high in London, we tried the experiment of bringing the Beckton coke down the river and landing it at Blackfriars and also at Westminster, the result being that on 1800 chaldrons we lost £250, and we therefore immediately desisted from that experiment. There will be a very important saving in the cost of lighterage and cartage when the Beckton station becomes more extensively used. The use of lime at Beckton for the removal of the sulphur impurities adds considerably to the cost of purification. The cost of lighterage and cartage at the Westminster station is 3s. 4d. a ton; at Bow Common, 2s. 1½d.; at Silvertown, 1s. 3d.; at Pimlico, 1s. 3d.; at Kensal Green, 2s. 9d.; and at Beckton nothing at all. At Westminster the wages for unloading are 1s.; at Bow Common, 6d.; at Silvertown, 1s. 6d.; at Pimlico and Kensal Green, 1s. 1½d.; and at Beckton nothing at all, because we claim from the coal-owner the cost of unloading the coals, which is 1s. 1d. a ton, and we get the advantage of that. There is also a charge on the Chartered Company of ·89d. for superannuation to different officers of the company when the amalgamations took place, but that will come to an end when the annuities cease. I have prepared a statement showing how the capital of the company has been raised. By the original charter in 1812 we obtained £200,000, and up to 1868 we obtained various powers amounting to £900,000; but up to that year we had no borrowing powers. In 1868 we obtained further powers of share capital, £650,000; loan capital in respect of the old capital of £300,000; and loan capital in consideration of the share capital then granted, £162,000. In 1872 we obtained power for an additional £1,000,000, with further borrowing power of £250,000; and by the various amalgamations we obtained the following sums:—The Great Central share capital, £200,000, and loan capital, £60,000; City of London Company, £400,000, and loan capital, £60,000; Equitable, £300,000, but no loan capital; Western, £600,000 share capital, and £200,000 loan capital; and Victoria Docks, £100,000 share capital, and loan capital, £25,000; making a total of £5,213,500.

By the CHAIRMAN: We have power by the Act of 1871 to amalgamate with any other company in London without going to Parliament.

Mr. WEST: The Board of Trade to have the superintendence of the terms.

Examination resumed: The whole manufacture, with the exception of Westminster, has been transferred to Beckton. The reason for the early creation of so much capital was, that there was very keen competition in the City of London, which brought about a great waste of capital. We had also to buy two or three miles of land to lay our mains in from Beckton, and no other company has had to do that. The particulars of the capital, which, for the reasons given, are unproductive, are as follows:—Curtain Road, loss on closing the station, £56,600; Blackfriars, estimated loss on closing station, £125,000, and amount due from Corporation, £170,000; Brick Lane, loss in removing works, £100,000; and works in course of construction, or not yet fully occupied, £200,000, making a total of £650,000.

By the CHAIRMAN: The total capital raised at 10 per cent. up to Dec. 31 last, was £2,300,000. There is £100,000 at 4 per cent., which was a capitalization of old profits of the City of London Gas Company. Then there is £750,000 preference 5 per cent., which will become 10 per cent. in five years from the date of allotment; and there are £813,500 debentures at 4 and 5 per cent., making a total at that date of £3,963,500. Since December last we have issued £500,000 on the same conditions as the £750,000, and we have now only £500,000 of capital and £250,000 of debentures which we can issue.

By Mr. BRASSEY: The price of our Beckton stock is at par, and the stock which we issued at 5 per cent. for five years is at 3 premium.

Mr. BRASSEY: As your powers of issuing debenture stock were not fully exhausted, why did you not exercise those powers in the first instance, before resorting to the more expensive method of issuing the ordinary stock?

Witness: We could not raise our debentures until we raised a certain proportion of the share capital. Lord Redesdale will not allow us the same borrowing powers as the other companies have obtained; and that has been the difficulty with us.

The CHAIRMAN: Now that you have issued the £500,000 since the 31st of last December, it is within your power, I suppose, to put out part of the £250,000?

Witness: Not yet; we have not called up enough of the shares to enable us to exercise those powers.

By Mr. BRISTOWE: Although we have issued £500,000, we have only called up £100,000 of it.

Examination resumed: The Chartered Company applied to Parliament this session for power to raise money as debenture stock without raising any new capital; but that bill was thrown out upon the petition of the Metropolitan Board of Works upon Standing Orders. The general average of the interest paid upon the whole capital of the company on Dec. 31, 1874, was 7·79 per cent. Up to 1868 the company had expended upon their works more than £370,000, which they might have divided in profits, but which they were not allowed to capitalize.

By the CHAIRMAN: A profit was made of nearly 10 per cent. for many years, and the company only divided 4, 5, or 6 per cent., and the balance of profits they expended upon works; and then Parliament, in 1868, upon the company asking to be allowed to capitalize that sum, said "No;" so that, so far as the shareholders are concerned, that sum is lost. I am not aware that any other company has been placed under the same obligation. There have been no such sums derived from revenue, and applied to the purposes of capital expenditure, since 1868.

The CHAIRMAN: When you were in the habit of applying part of your revenue to capital, you must have conducted your business upon a somewhat different principle than you do now, when you do not so apply it.

Witness: The shareholders were content, in those days, to have a small dividend, because they did not like to go to Parliament for additional powers. The amount so applied was used entirely in adding to the permanent plant of the company, and no portion of it went for wear and tear. Our present rule with regard to gasholders is to erect them and charge them to capital. All new retorts are also charged to capital, but renewals are charged to revenue.

By Mr. WEST: Whatever we do, with reference to these matters, is done under the directions of the official auditor of the Board of Trade.

By the CHAIRMAN: The Imperial adopt a special form of keeping the wear and tear account, but, after all, it is not a very large matter.

The CHAIRMAN: If we compare the two systems—the one before 1868, and the other since—if you were now to take stock of your plant, it would compare less advantageously, would it not, with the capital, than it would have done before that year?

Witness: Yes, it would.

Mr. WEST: That is true, at the present moment, because you are overburdened with your old stations as well as your new ones?

Witness: Yes; but the company have agreed to sell Blackfriars works for £170,000, which will go in reduction of capital, and any other outlying works that may be sold would go in the same direction, unless we wanted the land. The consumers had the whole advantage of that amount of dividend which was expended by the shareholders upon capital works. The yearly dividends for the past 15 years have been as follows:—1860, 9 per cent.; 1861, 7¾; 1862, 10; 1863, 11; 1864 and 1865, 11½; 1866, 8½; 1867, 6½; 1868, 5½; 1869, 7; 1870, 8½; 1871, 10; 1872, 9½; 1873 and 1874, 10 per cent.; but, had it not been that the Western Company, with which we amalgamated in July, 1872, brought over a reserve-fund of £33,043, the dividend paid in 1872 would only have been 7½ per cent. Prior to the amalgamation with the Equitable Company, the Chartered Company had no insurance-fund, but that company brought over an amount of undivided profit amounting to £29,776, which was made the commencement of our insurance-fund, that fund having been granted to the company by the City of London Gas Act, 1868. In the years 1871, 1872, and 1875, the company might have applied for revision to have enabled them to make up that fund, but by not so applying, the public gained £21,285 in 1871, and £23,539 in 1872, which was equal to 1½d. per 1000 feet, and in 1875 they gained £31,500, equal to 1¾d. per 1000 feet, the total amount gained being £76,324. Had all the companies in 1874 supplied 16-candle gas, as we do, the price charged would have been as follows:—Chartered, 5s.; Imperial, 5s. 1d.; Independent, 4s. 4d.; Commercial, 4s. 10d.; Ratcliff, 4s. 7d.; London, 5s. 4d.; Phœnix, 5s. 4d. and 5s.; South Metropolitan, 3s. 5d.; and Surrey Consumers, 5s. 4d. With the exception of the Chartered and South Metropolitan, none of the companies were subject to the purity clause of 1868. The greatest daily delivery of gas in 1874, on one day, was on the 22nd of December, the supply being, from Westminster, 2,079,000 cubic feet; Bow Common, 3,073,000; Beckton, 14,150,000; Silvertown, 361,000; Pimlico, 2,957,000; and Kensal Green, 3,560,000; making a total of 26,180,000 cubic feet. The number of consumers was about 62,000, the total consumption during the year being 3,929,740,000, and the average consumption 63,383. The total rental was £1,003,818, and the average rental £16 3s. 9d. The comparative cost of common coal delivered into the retort-houses at the companies stations in the year 1874, was—Westminster, 23s. 11·5d.; Blackfriars, 26s. 1·3d.; Bow Common, 25s. 9·3d.; Beckton, 22s. 5·4d.; Silvertown, 24s. 8·1d.; Pimlico, 25s. 6·5d.; Kensal Green, 26s. 4·4d. The greatest make of gas in one year at the stations which are now closed was as follows:—Curtain Road station, 174,646,000 cubic feet; Brick Lane, 462,249,000; Blackfriars, 604,679,000; and Westminster, 970,551,000, giving a total of 2,212,125,000. We divided 11¼ in 1864, under the Act of 1860, which enabled us to pay back dividends, having made that extra profit during the year. In 1862 we paid 9½ per cent. for the current year, and ½ per cent. back dividend to Christmas, 1856. In 1857 the dividend was 6 per cent., but the shareholders subsequently received a back dividend of 1 per cent. In 1858 the company paid 7¾ per cent., and 1¾ per cent. afterwards. In 1859 they paid 8 per cent., and then 1¼ per cent. subsequently. In 1861, when the dividend was 7¾, no back dividends were paid. The back

dividends were paid to the existing shareholders, shares being bought in the market with a right to all contingencies.

The CHAIRMAN: If anybody says you are guaranteed 10 per cent., you have only to point to the years 1869 and 1870, which was after the passing of the Act of 1868, to say that is clearly not the case.

Witness: Quite so; there is no doubt about that. If we do not make a dividend we cannot pay it.

The CHAIRMAN: From 1866 to 1869 inclusive you were at 4s., and got about 7 per cent. average dividend; in 1870 you reduced the price to 3s. 9d., and you paid 8½ per cent.; and in 1871, at the same price, you paid 10 per cent., having to furnish 16 candles. Do you consider being able to furnish a better gas at a less price, and to pay more dividend, was all owing to the price of coal?

Witness: There was the amalgamation that year with the Equitable, which was a very prosperous little company, and helped us considerably. They brought in a rich district—the Strand, and parts about there—with a very good consumption, and they had been making full dividends for years past. One great difference the Act of 1868 has made to us is, that we are unable to pay back dividends. We have never formed a reserve-fund, but there was a small accident-fund of under £1000.

By Mr. WEST: There was once a contingency-fund, but it was all absorbed by the great Saville House fire.

The CHAIRMAN: You say that, if all the companies supplied 16-candle gas, the prices charged would be those you have put down. Amongst others is the Imperial 5s. 1d., and the South Metropolitan 3s. 5d. How do you get at that?

Witness: By the City of London Gas Act it was stated that for every additional candle 2½d. was to be charged in price.

The CHAIRMAN: But you framed your calculation upon the supposition that the real difference between you and the other companies is two candles, although, practically, the difference is nothing like it, is it?

Witness: There is a certain amount of difference. The calculation is framed upon the statutory illuminating power of the companies. The amount of interest now paid upon the whole capital of the company—both share and loan—is 7·79 per cent. From 1861 to 1865 the Equitable Company paid dividends varying from 15½ to 13¾ per cent., their power to pay back dividends under the Act of 1847 being unlimited. The Great Central Company was, up to a certain point, a very prosperous company, but during the last year or two of their separate existence they incurred a terrible loss of £78,000 by the default of one of their officers.

Mr. PHILBRICK: Supposing that the old burner of 1860 was 12 candles, and that by the burner of 1866 that same quality rose to 14 candles, and by the present burner to 16, where would you get a justification for adding any one of your 2½d.'s?

Witness: If all the companies supply the same gas, of course there would be an end of the matter.

Mr. PHILBRICK: The whole of your capital, when the option is exercised at the end of five years, will be a 10 per cent. capital; and, of course, except in the case of the capitals of the amalgamated companies, which were less than 10 per cent., and which remain where they were, there is nothing in the Chartered less than 10 per cent.?

Witness: No.

Mr. PHILBRICK: The general provision in the Chartered Act has been the same as in other companies Acts—namely, power to borrow one-fourth of the amount of capital authorized—do you not know that every time £10,000 of capital is subscribed for, and half is paid, you have power to raise £2500 by loan?

Witness: Yes; but we have issued £500,000, of which only £100,000 is paid, and therefore we cannot put the borrowing powers in force yet.

Mr. PHILBRICK: Could you not have done it otherwise if you wanted to exercise the borrowing powers?

Witness: Yes; but we should be issuing capital every week if we did it in that way.

Mr. PHILBRICK: If you had issued £200,000, and had called up £100,000, you would have had powers to borrow?

Witness: Yes; but as the £100,000 we have raised was at 5 per cent., there would have been no advantage in doing it.

Mr. PHILBRICK: Respecting the £170,000 due by the corporation, are you aware that Mr. Beck justifies the sale on the ground that it was bearing 10 per cent. interest, and that there was a dead loss of £17,000 a year to the shareholders if they left the land vacant?

Witness: I am; but I believe that to be a mistake. The "estimated loss on closing the stations at Curtain Road and Blackfriars" includes the cost of what had been charged to capital for the old plant.

Mr. PHILBRICK: Then if you are going to substitute Beckton for those places, and new capital would be employed in erecting new works, ought the old capital so destroyed to exist?

Witness: Parliament intended it should be so, and that is the system on which the account was prepared; it is equal to £1 7s. 6d. per ton of coal, or between 3d. and 4d. per 1000 feet of gas, and it is a permanent charge.

Mr. PHILBRICK: When before the Revision Commissioners, in your charges for 1873 you included £5000 brought to the debit of the consumer for Higgs. Was that before any balance was appropriated, or attempted to be appropriated, either in reduction of the price of gas, or towards the contingency-fund?

Witness: Yes. If it had not been so paid, it would have gone to the insurance-fund. That fund was fully made up in 1874, to the extent of 1 per cent. for the year.

Mr. PHILBRICK: So that you started with £5000 to the bad, which, if it had been appropriated to a payment in respect of dividend, would have gone in case of the insurance-fund?

Witness: Yes; but since that time we have had the opinion of the law officers of the Crown, who say that the mode in which we have dealt with that sum of £5000 was perfectly correct.

Cross-examination continued: In 1874 the sale of gas by our company per ton of coal carbonized was 8839 cubic feet, which was an improvement on the preceding year. The average sale of the companies in 1869, before any amalgamation took place, was 8438 feet; so that in 1874 there was an increase over the old companies of 401 feet.

Mr. PHILBRICK: Let me put it in my own way, and see how that result bears. Your gas-rate in 1869 of the Chartered Company was 8251, and the City of London, one of the absorbed companies, was 8925, which is better than your present make of 1874?

Witness: Yes; but why pass over the Great Central?

Mr. PHILBRICK: That is 8054. Then you swallowed up the good and the bad, and brought the thing out to a level. As to the Equitable, their working in 1869 was 8966, and in 1870, 8989; and the Western, which was the rich bride that came to you so well endowed, was 8847 in 1871; still in excess of all the Chartered can do with its present appliances?

Witness: Yes.

Mr. PHILBRICK: When you went before the Revision Commissioners in 1874, you had made an estimate of the trading in that year. Was the result of that trading better than your estimates by the sum of £75,425.

Witness: No; the net result was nothing like it.

Mr. PHILBRICK: If the thing had turned out according to your estimate, that would have been the result; but, as a matter of fact, the result was that the consumers had paid £48,180 too much, which would represent nearly 3d.; so that, after doing everything that the Act of Parliament provided, it was in effect £50,000 more charged upon the consumers of your district than had any right to be charged?

Witness: We were fortunate enough, by better care, and by the very good rearrangement of coal contracts for that year, to show a better working, compared with our estimate, of £48,180.

Mr. PHILBRICK: One great matter that we differed about was the probable increase in the consumption of gas, and that, of course, would be a matter which would go very much to the net profit of the concern. You estimated something over 2 per cent., and it turned out 6½; that 4½ per cent. was sheer profit, was it not?

Witness: Of course the difference between the making of gas and the selling was used as our profit.

Mr. PHILBRICK: You had already estimated your charge for coal, wages, and so forth, so that they were standing charges?

Witness: No; an increase necessitated an increase in coal and wages.

Mr. PHILBRICK: You had estimated, had you not, that your coals would be £700,000, whereas, in reality, they were under £610,000, and you were over £90,000 in excess of your estimate in that one item?

Witness: That is your way of putting it, but inasmuch as the basis upon which we made that estimate was altogether altered during the year, it is not fair to say that my estimate was wrong to that extent. The contracts which existed when we were before the Revision Commissioners, and which varied from 25s. to 29s. a ton, were, shortly after the revision ended, owing to the reduction in the price of coal, cancelled, and we entered into new contracts at varying rates of 18s. 9d. to 19s. 6d.

By Mr. BIRLEY: The coalowners were willing to cancel the contracts, on the condition of our extending the period and the quantity. Upon that we saved £48,714.

Mr. PHILBRICK: The excess that you got of 4½ per cent. of the gas sold was not caused by any relative increase in the quantity of coal carbonized over the estimate?

Witness: Calculated at a rate which we assumed the gas would cost to make, it entailed a certain increased cost. We saved £36,000 in manufacture alone.

Mr. PHILBRICK: Let me ask you to follow this. Your net price of coal is one of the most important items in the Chartered Company's accounts, and of your residuals, coke is of the most value. The price of coals went up, but did you not get more for your coke, in proportion, than you used to? In 1869 your coal is 27·87, and the coke 6·61, which is less than 25 per cent. of the coal. In 1870 the comparative figures are 26·46 and 7·55, which is more than a quarter. In 1871 it was 24·17 and 6·67, again a trifle more than a quarter. In 1872 coal was 28·82, and coke 7·39, again a little more than a quarter. In 1873, the great year of the disturbance, coal had got up to 35·57, and coke 12·81, a little more than 32 per cent.?

Witness: Yes, but the coals for 1873 were not at the high prices.

Mr. PHILBRICK: But you got the benefit of the contracts running, some of which were at the lower price, and then you got the benefit of the price of coke in the open market at once at the higher price, which brought you to over 33 per cent.?

Witness: Yes.

Cross-examination continued: Although other matters were referred to in the bill brought in by our company this session, the power to borrow, on mortgage of our undertaking, at 6 per cent., without any restraint as to amount, was the main feature of the bill.

Re-examined by Mr. WEST: The revision of our coal contracts took place in May or June, and the report of the commissioners appeared in March, so that we could not have calculated, at that time, with any security, considering the great fall in the price of coal. Before the five years expire in which our 5 per cent. shares will be converted into 10 per cent., we shall have spent all the money, and exhausted all our borrowing powers. We have some debentures at 4½, and some at 5 per cent.; and, as they fall due, we pay them, and replace them by debenture stock, paying 4½ per cent. interest. I do not know that that stock has ever been quoted in the market.

[During the examination of this witness, a number of tables were handed in, corroborative of the various points mentioned in his evidence.]

Mr. *Simon Adams Beck*, examined by Mr. WEST.

I am the governor of the Chartered Gas Company.

Mr. CRIPPS said he had no question to ask the witness.

Mr. WEST said that closed the case on behalf of The Gaslight and Coke Company against the bill.

THURSDAY, JUNE 24.

The CHAIRMAN said, before Mr. Cripps began his reply, his colleagues wished him to make a remark. A very important part of the bill was the possible prevention of the companies earning 10 per cent. dividend. It had been very strongly alleged by the companies that they had a vested right, not to a guarantee of 10 per cent., but to charge for gas up to 5s. 6d. by the help of the revision, in order to get 10 per cent. He did not doubt that Mr. Cripps would direct his remarks to that point, but it was a point upon which the committee would be very glad to have his view.

Mr. CRIPPS, after some introductory remarks, proceeded to vindicate the policy of the Corporation and the Metropolitan Board in promoting the bill, they having, as he alleged, been instigated thereto by repeated complaints made to them by the consumers, in consequence of the advances made in the price of gas. This was, in fact, a movement commenced by the consumers of gas in the metropolis through their representatives in the first instance, the vestries, and then by the vestries communicating with their superiors, the Board of Works, and calling upon that body to interfere. The Board of Works had taken up this matter, as they were bound to do in the first instance, they having been constituted by the Act of Parliament the defenders of the consumers in this matter. And he would ask them, was that dissatisfaction of the consumers of the metropolis an unreasonable and unnatural dissatisfaction to feel under the circumstances? They found a sudden rise and a sudden expense put upon them for an article which no doubt was one of primary necessity, and they found that that was put upon them by a company who for years past had been dividing a full trading dividend obtained from them of 10 per cent.; and that it was in consequence of one of those accidents to which all traders are subject—that is, a greater cost in supply of a portion of the raw material used. And certainly he could not but think that it was not only with reference to that particular rise, but that whenever a revision took place it never could take place under circumstances satisfactory to the consumers. The consumer would always feel that he had been allowing the company to divide 10 per cent., and that they ought not to be calling upon him to pay the rise which he did not anticipate in any way whatever. They must feel it contrary to all principles of trade that the rise in the price of any raw material should fall exclusively upon the consumers of the manufactured article. The argument of Sir E. Beckett that the amount in dispute was a very insignificant one was no answer to the consumers complaints. It was not the smallness of the pecuniary gain or loss that affected the man so much as the injustice of it; and if it were a great deal smaller than it was to each individual, it would still be an injustice and a grievance. It was one that he would never be satisfied with, and never put up with in trade. He would feel that it was an injustice, and while it continued he would never be satisfied. To say that it was a vital question to the producer—i. e., to the company, was to forget altogether that the company consisted of shareholders; and when they came to divide the profits amongst the shareholders, the individual gain or loss to the shareholders might be even less than the increased price to the

individual consumer of gas. But whether it was or not, the question was quite immaterial. It was a grievance and an injustice, and one which an Englishman would continue to call upon those who ought to protect him to protect him against, and he would not be satisfied to pay it. Now this was a matter which it was open to the Legislature to interfere with. And that brought him very much to the question which the chairman had called his attention to, and one to which he ought to address his particular attention—namely, the perfect freedom of the Legislature to deal with this matter; nay, more than that, its duty to deal with it from time to time for the protection of the consumer. The first Acts referred to were those of 1847, and a great deal had been made of that by saying that it guaranteed to those adopting it a 10 per cent. dividend. It did nothing of the kind. The companies were obliged to read the words, "not exceeding 10 per cent." as "never less than 10 per cent.;" and their contention did not stop there, but they altered those words. If the words in that Act had been "a dividend never less than" instead of "not exceeding" they could not have insisted in words more strongly than they had in the present case. But it was not an Act passed with reference to gas solely, nor did that legislation apply merely and entirely to gas companies. The policy of the Legislature had been in all cases where companies had acquired parliamentary powers, whether railway, gas, or water-works companies, to take care that after the concession of certain powers to them, the dividend of those companies should not exceed 10 per cent. He had before him the Water-Works Clauses Act, 1847, in which the words with regard to companies established for the supply of water were identically the same as they were in the Gas-Works Clauses Act. With reference to the reserve-fund and the contingency-fund, they ran word for word; and it could not be alleged that anything was granted by the Act of 1847 for gas companies, which had not equally been conceded with reference to water companies. Railway companies, though arranged in a somewhat different way, were under exactly the same restrictions with reference to their profits. It was a provision which the Legislature had thought fair to apply to all companies, not to give them any prescribed rate of dividend; but that, inasmuch as parliamentary power must more or less confer something of a monopoly, at any rate give a privilege, that that privilege should never be extended so as to charge the public more than 10 per cent., and that if the profits at any time arrived at 10 per cent., the consumer or user of the railway, or the consumer of gas or water, should be not only a sharer in the surplus, but that the whole of the surplus, whatever it might be, should go entirely to him. When he opened this case he was very careful to point out the immense boon which Parliament conferred upon the companies by the Act of 1860. The matter which the companies had been fearful of from the very commencement, and the only real thing which they had terror of, was competition, and when the Act of 1860 stopped competition, and gave the monopoly to the companies, it gave them more than any possible restrictions imposed upon them, could in any way whatever take away from them. The tables of annual profits of the different companies, appended to Mr. Cardwell's report, showed that the effect of the legislation of 1860 was that it at once raised the prosperity of the companies, in some cases from paying no dividend before, to the highest maximum dividend that the Act of 1847 or the policy of Parliament ever allowed them to divide. Now, these were all money-getting companies, of course, and the only test of the prosperity of a company was the dividend of its shareholders. It is the only thing looked to by commercial companies of this kind; and when persons talked of hardships to companies, and oppression to companies, and that they had been oppressed by the consumers and by the board, it must not be forgotten that the effect of the legislation (which, of course, was what they were complaining of now) was to give them that sort of prosperity which no other companies in the kingdom enjoyed. The metropolitan gas companies were an exception to every other company which obtained power by Act of Parliament with reference to their financial position.

The CHAIRMAN: I know nothing about it myself except what I have heard in this room, but does your remark apply to water companies?

Mr. CRIPPS: Yes, naturally so; some of the water companies divide as much as 6 per cent.—that is about the highest dividend—and some have not done so well.

Mr. BAXTER: The largest company in London—the New River—is dividing 9 per cent.

Mr. CRIPPS said they were in a state of exceptional prosperity, and it was obvious that that exceptional prosperity was entirely due to the protection of Parliament. Parliament interfered in 1860 to do what they thought was fair between the consumer and the gas companies; they had done what was more than fair, they had done that which had put those companies into a state of unexampled prosperity; and those companies now said, "As you interfered then between the consumers and the company, you have ensured us that enormous prosperity, and you shall not again interfere with the companies in any way." The Act of 1860 was brought in by the consumers. It was promoted by the vestries to regulate these matters, and the committee upon that occasion intended, no doubt, to do what was fair. It never was suggested for a moment, upon that occasion, that Parliament was not omnipotent in the matter, and had not the fullest power of regulation to the benefit of both parties in any way they thought proper.

The CHAIRMAN: It is stated on the other side that the very fact you are alleging, that they were put into an exceptional prosperity by that Act, would be the basis upon which a fresh purchaser would buy shares after 1860.

Mr. CRIPPS said it was so, and he had no desire to destroy the prosperity which they enjoyed. He was only showing the prosperous state in which they were put by that legislation. But he did not quite assent to the principle that a party who bought his shares subsequently was in any different position to the party he bought them of. He was the successor of the original shareholder, and the company continued a company. He did not think there was any greater right in the party who bought shares, and gave a greater price for them, as against anybody contesting with the company, to claim protection more than a person owning the shares a year before. The company was formed of shareholders, but those shareholders were changing *inter se*; the company remained a company just the same as far as any person dealt with them, and as far as Parliament dealt with them. Although the Act of 1860 was brought in apparently adversely to the companies, yet nobody pretended to set up the doctrine that Parliament could not interfere with them. The companies and the consumers were before the committee, and the committee sat as arbitrators between them; the committee exercising the power of Parliament. It was assumed that it was a matter over which Parliament had the fullest authority to deal, inasmuch as those companies were the creatures of Parliament; and inasmuch as, if any monopoly was given at all, it must be a regulated monopoly, and it was the duty of Parliament to regulate it. Legislation having taken place in 1860, very shortly there seemed to have been a good deal of dissatisfaction. This was not very surprising, because it was intended by the Act to give 12-candle gas to the metropolis; but almost immediately afterwards a burner was invented which reduced the 12 candles to nearly 10 candles, and the effect of the bill was that the companies could supply worse gas than they were supplying before. That created a good deal of dissatisfaction, coming as it did simultaneously with its being known that the Act enabled the companies to increase their dividends to 10 per cent. The consumers felt that the companies enjoyed the full prosperity of the Act, while they got the disadvantage of a slip made in the Act. They paid the same for a worse article; nay, they paid more in some cases, because the Act enabled the companies to divide back dividends within six years, and some companies did divide as much as 15 per cent. just afterwards. From that dissatisfaction arose the fact that the Board of Trade introduced a bill in 1866 for the purpose of further regulating the gas companies, and to inquire into the operation and results of the Metropolis Gas Act, 1860, with the view of saying what could be done with the Act. The report of that committee contained recommendations for a number of new restrictions upon the gas companies, and amongst these that the minimum illuminating power should be increased, and the maximum price should be reduced. They made no suggestion as to the reduction of dividend. The importance of this report was to show that there never was any difference of opinion in the committee, although it was a large one, consisting of twelve members, about the power of Parliament to deal with the question. It was a matter over which they assumed to have the most perfect and full control. A great deal of criticism had been passed upon that report, and it had been said that it was not a fair report, because the evidence of the gas companies was stopped, and not so fully gone into as it might have been. The committee, however, heard a great deal of evidence, and they had a speech from the counsel of the gas companies. Mr. Baxter was examined at great length, and cross-examined at great length, and he made, as he always did make, a very favourable impression upon the committee; and the committee having heard Mr. Baxter, and having heard what the counsel for the gas companies proposed to do, did not stop the evidence at all, but they suggested to Mr. Hope Scott whether it was worth while to go further into the matter, as they thought they pretty well understood the question. They did not say, "You shall not go on;" but Mr. Hope Scott said, "No, I think we need not go on." They did not stop then. The committee said, "We think we understand this question. Is it worth while to go further?" The committee might possibly have done what committees, according to his experience, sometimes did; they forgot they had two things to do. Every tribunal had to do justice—that was the first thing; but they had a further consideration, which was to satisfy the suitors that justice was done. Sir John Trollope's committee did justice between the parties; but in the result, from being in a little too much haste, they failed to satisfy the suitors that justice was done. If they had heard the companies witnesses, it would not have been the least likely to have made the slightest difference, but it would have deprived the gas companies of the sort of complaint which they had put forward ever since. When Mr. Burke was examined in connexion with the present inquiry, he admitted that Parliament having granted the companies a monopoly, had the right to place those companies under fair regulations. This was a very important admission, coming from Mr. Burke. He (Mr. Cripps) knew Mr. Burke's splendid intellect, which had been the great cause of his success; but he was troubled sometimes with gas upon the brain, and though the pressure of it might be great, its illuminating power, when it got there, was not always very great in Mr. Burke's case. He (Mr. Cripps) took Mr. Burke's reply as an admission of the whole question of principle between the parties. He said in effect, "We have no objection to regulations, if you, Parliament, will take care that there shall be one company to supply a district; it is perfectly fair that we should be regulated." In 1867 the committee which sat upon the bill introduced by the Board of Trade stated that they considered the main cause of the failure of legislation in that year was the absence of any bills authorizing the establishment of an independent supply of gas in the hands of the local authorities; and they recommended that, unless terms satisfactory for the consumer could be arranged with the companies. Every facility should be afforded to the local authorities of the metropolis, in the session of 1868, for the introduction of an independent supply. What Mr. Cardwell's committee seemed to have considered then was that Parliament had not full power to deal with the matter of regulation, unless they had before them a competing bill; and then that by holding a competing bill *in terrorem* over the companies, Parliament could coerce those companies into accepting something, which, if there was no competing bill held over them, they could not be induced to accept. Now, he (Mr. Cripps) took the liberty of saying that this was an entirely unsound principle. If it was right and proper and fair for Parliament to interfere in the regulation of these companies, the omnipotence of Parliament could interfere with it; if it was not right and fair to interfere with these companies by regulation, it could not be made fair by having a sham bill, and holding it before the companies *in terrorem*, and saying, "If you do not submit we will pass this bill." Was Parliament obliged to resort to a sham in order to do what was just? and had anybody up to that time, or did they now, say substantially that Parliament had not full power to do it? He (Mr. Cripps) went as far as Mr. Burke did in this view, that nobody in his senses contemplated, when the supply of gas was already provided for in London in the way it was, that there should be an actual supply by another company coming in to compete with them, sacrificing an immense amount of money absurdly to provide a thing which was no gain to the consumers or the companies.

The CHAIRMAN: Nevertheless your clients did prepare a bill for it in this year.

Mr. CRIPPS admitted that the bill was a sham for the purpose for which it was intended, but it was strictly within the terms of Lord Cardwell's report; and the Metropolitan Board had considered that question, and, being advised by legal authority, they thought Lord Cardwell's report was so strong that if they did not come with a bill of their own they were out of court; and for that reason an enormous expense was incurred, and they went for a bill, which Mr. Newton in his evidence said they never wanted to pass, and it was not their policy to pass. Now, what took place with that bill? Why, what would take place with every bill introduced as a sham; it was thrown out upon the second reading. He could not help thinking that, after all, it was a matter in which he and the gas companies would not greatly differ, whether he represented them or the consumers—that it was an unsound doctrine, and it was very desirable that the doctrine should not be supposed to be maintained, or cause expense to parties one single hour longer than was necessary. It was entirely opposed to Mr. Burke's view of the matter, it was entirely opposed to what had taken place in former years, and it was a limitation of the power of Parliament to be got rid of by a sham bill. He could not think for a moment that the power of Parliament to do a thing which was right and fair could depend upon a weapon which was not fair, because it was not fair to the companies to say, "If you do not submit to these particular terms, we will pass this bill and ruin you;" for it came to that.

The CHAIRMAN said there were one or two passages in the report of Mr. Cardwell's committee which not only suggested competition, but which could be interpreted to be in favour of Parliament, not interfering by any regulation with the earning the 10 per cent. up to 5*s*. 6*d*.

Mr. CRIPPS said he was quite aware of those passages in the report, but he assumed the only meaning of them was that what Parliament did should be fair, considering the existing position of the companies. They were to look at the companies rates at the present time, and in any regulations they imposed upon them they ought to take care, so far as they could, not to put the companies in any worse pecuniary position than they were in before. That they all assented to. It was a mere question of detail, what were fair and proper regulations for some tribunal beyond that of the companies and the consumers to fix.

The CHAIRMAN: Probably the strongest passage in the report—although that might be used by you as well—is the passage where they state, "and while they do not feel themselves at liberty, as they have already said, to interfere with the enactments of 1860 in that respect, without the consent of the companies."

Mr. CRIPPS said there was a great deal in the language of the report which seemed to carry with it the supposition that the way of dealing with this matter was by a competition bill, and having that idea, they possibly framed their report rather in that sense. They evidently were looking to the possibility of

that. But assume that that was so, and that they ought to draw their regulations so as to leave the companies (he quite assented to the proposition) a dividend as near as possible 10 per cent., was it consistent with that to sanction a competing scheme? Was it fair to hold a competition scheme over the companies, and say, "See, we can force you down; because, if you do not comply, you may be ruined by the competing scheme." It seemed to him that the report contained a great deal which was not quite sound, and this certainly was inconsistent with the law of Parliament up to that time; and when it was examined was not consistent with common sense, or with what ought to be fair dealing with Parliament, they being the arbitrators between the consumers and the company.

Mr. BIRLEY: That is a point I wish to be enlightened upon, as to whether there are precedents in parliamentary practice for this doctrine; because it is a serious one if it has been laid down by other authorities, as well as this committee.

Mr. CRIPPS: I am not aware of such precedents; and if there are any, I do not think they are worth following. I know the gas companies cry out against the Metropolitan Board as not being fair; but the Metropolitan Board have no other object than to settle this matter fairly; and if I had to argue in favour of a competing scheme to force the companies into 5 per cent., or anything of the kind, I should say I cannot argue it; and I would not argue it.

Mr. BRASSEY: With reference to the interpretation which the Revision Commissioners seem to put upon the Act of Parliament, I should like to refer you to the proceedings in reference to The Gaslight and Coke Company in 1874. They say, speaking of the capital of £2,299,000, "it bears 10 per cent. dividend." They say also, in speaking of the Imperial Company's capital, "it bears 10 per cent." What do those words mean? Does it seem to you to be confirming the fact? Do not the commissioners seem to take it for granted that it is 10 per cent.?

Mr. CRIPPS said his attention was called to it now for the first time. No doubt the commissioners would explain what they meant. He now came to the legislation of 1868, which was the consequence of that report of 1867. In 1868 Mr. Cardwell passed a bill, which was not quite a sham bill, and yet which ultimately was not in itself a bill approved by any company. It was called the City of London Gas Act, 1868. This was not a bill regulating any company at all, but was a sort of model Act, which other companies were to be made subject to, and not particularly binding upon any one unless they were made subject to it. In that year the Chartered Company, having a bill before the House, assented to come under the terms of that Act, rather than lose the opportunity of raising fresh money. The important part of the Act of 1868, so far as he was now concerned with it, was what were called the revision clauses. Those revision clauses were not entirely new—they were amendments, and supposed to be improvements, of a clause to the same effect in the Act of 1860. The Act of 1860, section 40, provided that there might be a possible alteration, and an increase in the cost of gas; and that, if it was desired, notice should be published, and that the local authority might dissent from the alteration if they pleased, and that upon their dissenting the matter should be referred to arbitration. Now, in a less perfect way, the Act of 1868 embodied the revision clause of 1860. Substantially, there was much less difference than there appeared to be; because under neither of the Acts were the Board of Works or the City compelled to resist the increase of price, if they thought it the proper thing to be allowed. In both of them, if they did think it an improper thing, they were allowed to go before a tribunal to decide the question, and that tribunal, in either case, was to be appointed by the Board of Trade; but, in the one case with a single arbitrator, and in the other case, three arbitrators. The three arbitrators, under the Act of 1868, were armed with much more extensive power. He could not conceive, knowing how insufficient the powers of the 1868 Act were, that it could ever have been supposed by anybody who had thought about the question, that the provisions of the Act of 1860 could have been of the slightest avail whatever. That Act of 1860 had never been put into operation, and it was all very well, on the system of *omne ignotum pro magnifico est*, to say if it had been tried it would have acted favourably. The revision clauses of 1868 were clearly improvements upon that Act, and went very much further. They were intended for the protection not of the gas company only, but also of the consumers; but, in the result, they had been tried and found to be a total failure. The only argument he had heard throughout, saving from the Chartered Company, in favour of those clauses, was an argument, which was no argument at all, that the corporation themselves put those clauses in. He could not say how it might have been, nor did he think it at all important. They probably were put in rather more by the companies than by the corporation. Both parties were before the committee, and both parties accepted them; therefore, it was not important who first devised them. The corporation were certainly chargeable with having accepted them, and they did think them sufficient for the purpose, and would have the effect that they were intended to have. But they insisted upon them in 1869, having no experience of them, and being in the same mind as they were in 1868. The argument that they were still bound, after the experience they had had, to adhere to those clauses was absurd; but he did not know how far he was called upon to defend them, because, with the exception of the Chartered Company, they were universally condemned, and the Chartered only supported them for the reasons that he would hereafter allude to. The learned counsel proceeded to comment on the working of the Act, when practically tested before the commissioners, in reference to the question of capital and insurance-fund. He contended that the whole principle of attempting, by a tribunal out of the company, to investigate the management and trading in the company, was an impossibility. This committee had been sitting a good many days, and had acted as a revision committee to some extent. Supposing they were told now, as against the companies who desired to have a particular price, that they were to fix a lower one; although they had gone into this matter with great care and attention, they would say to the promoters, sitting judicially, "You have made out no case; you have shown no case of gross negligence against the companies. We had their chairman here, who has given a full account of the care they take; we have had their engineer and secretary, and we have not found out from any of them anything that we can act upon; how can you ask us to cut down the price of those companies?"

The CHAIRMAN: If I was asked, as a member of the House of Commons, to find out if they had exercised due care and management, I should accept the Chiltern Hundreds.

Mr. CRIPPS said he was sure the committee would not undertake the responsibility, even after the full inquiry that had taken place. How could they deal with questions of skill in management, skill in buying, and skill in selling? He felt that this was an important matter for the committee to consider, after having heard the evidence, because one important matter proposed by the bill was to do away with that which affected to be a protection to the consumer, and, when examined, proved to be no protection at all; and which, from the nature of things, was a guarantee to the companies, whereas it was only intended to render matters fair as well for the company as for the consumer. These were matters which were difficulties in an application of the company to Parliament, with all the facts in their knowledge. What hope would there be for the consumer to apply if he thought he had been charged too much? Every single detail was out of his hands, and yet every single interest was his own when the company had got their 10 per cent. Every single farthing, under the present state of the law, was the consumer's property; not a sixpence more than that 10 per cent. could go to the representatives of the company. Yet for that the consumer, to get his own property, could not employ a servant of his own; he was dependent upon the companies, their officers, their servants, their administration; and, if he complained that he was not getting the proper amount, he had to investigate it through the companies, through their officers, through their servants, and through their administration. Was not the proceeding perfectly hopeless? Now, the first thing that was proposed, therefore, was that those clauses which were a sham for any real purpose should be struck out, and something more efficient substituted; and the great question which had to be considered was, what could be substituted better and more efficient than those clauses as they stand? By the bill it was proposed to fix the illuminating power of the gas at 16 candles, tested by a particular burner, at the initial price of 3s. 9d. per 1000 cubic feet. And he thought the companies should give the promoters credit for some liberality in this matter. They put 3s. 9d. in the original bill, which had only a sliding scale one way; and everything in that state of things which could be earned by the companies above 10 per cent. at the 3s. 9d. price would go the consumers. When it was proposed to put the sliding scale both ways, and to make the company a sharer with the consumer, in all profit that could be made at a price less than 3s. 9d., they made no alteration in their proposition; they did not seek to alter the initial price. Probably if they had had to consider the matter in the first instance, taking the words of the Board of Trade report, and looking prospectively to the future, they might have thought 3s. 9d. much too high to put in as the initial price. But they made no change in it, so they were prepared now to make no change in the price proposed originally. He was not aware that throughout the whole inquiry any other price had been even prominently put forward, but with regard to the 3s. 9d. price, what was it at the present time? It was the price which the Act of 1868, and the framers of that Act, thought to be a fair initial price; at the present moment it was the initial price of more than two-thirds of the metropolis; it would be the initial price by consent of the Commercial Company, to be put in their bill, which company was not already under the Act of 1868; and by force of that it would be the initial price of the London Company also; it was higher than the initial price of the South Metropolitan, and therefore it might be taken as extending to the Phœnix and the Surrey Consumers. It was the price which at the present moment was the legal price throughout the metropolis; it was the price imposed upon the Chartered Company, and accepted by the Imperial and by the South Metropolitan in their Acts. Now, was it a fair price? None of the companies at the present time could charge more, excepting under the revision clauses, and it was not suggested for a moment that any companies would think of that, except some abnormal circumstances arose. It might be taken, therefore, by the consent of all parties in the normal state of things as a fair price, and a liberal price for the consumers to allow. A good deal had been gone into to show that gas could not be produced at a price so low as that. First of all it was being produced at that price, but they had tried it in the way which was almost the only way in which the matter could be tested, as to whether it was a fair price or not. They had the advantage in this inquiry of those authentic tables published by Mr. Field, who deserved great credit for his industry in the matter, which showed the working of the different companies, and the different sums they charged, why it had to be charged on account of certain expenses, and how that amount, when charged and received, was applied by the companies. And they had before them the fact of the South Metropolitan Company, because in the mere manufacture of gas, what one company could do another company could do, unless there were some exceptional circumstances pointed out. The South Metropolitan Company at the present moment were charging 3s. only as their price. They had charged that price for some considerable time past, excepting that during the time when coals were very dear they had recourse to a small portion of their reserve-fund, which was equivalent to having charged a 3s. 2d. price. And that company were in an extremely prosperous condition, because they divided 10 per cent. upon the whole of their capital. If the South Metropolitan Company could do it, why could not the other companies do it, but for exceptional circumstances? Mr. Chubb, the secretary of the Imperial Company, and those who advised him, and whose witness he was, seeing that that was the position, put in a table to prove the difference between their working and the working of the South Metropolitan Company, and which, if looked at, proved most conclusively that the 3s. 9d. price for the Imperial Company would enable them to carry on their trade successfully, and to divide all the dividends which they had been hitherto able to divide.

Mr. RICHARDS: My learned friend has throughout been representing the 3s. 9d. price as being a thing that we are agreed upon. True, the 3s. 9d. is what we charge now, but it is for a different article; one is for 14 candles and the other is for 16 candles.

Mr. CRIPPS said Mr. Livesey's evidence and Mr. Keates's testings showed that practically the South Metropolitan Company supplied 16-candle gas, and by the present bill it was not proposed to subject the companies to any penalty for half a candle deficiency from that standard. The companies said that, if they were called on to supply 16-candle gas under penalties, they must make 18-candle gas, and charge 3d. to the consumers on every 1000 feet, in order to ensure against penalties. Why, 3d. per 1000 would be 50 times what all the possible penalties in the year could amount to put together. Here was the gas made at the works; it was capable of being tested every minute by the parties making it; it was an article entirely within their control, and it was made by servants and officers who ought to be thoroughly acquainted with the making of it; they knew what they were about; and were they to do their work so carelessly and inconsiderately that they threw away 3d. upon every 1000 feet, for fear of a possible penalty if they went down three-fourths of a candle? It was treating the penalties as if they were the most grievous penalties to the consumers; it was making the consumer pay 3d. per 1000 for the mere idle supposition of a penalty. He was informed that, during the time the present Act of Parliament had been in force, no penalty had actually been imposed upon a gas company.

Mr. RICHARDS: No penalty has ever been incurred.

Mr. CRIPPS: That I do not know; but no penalty has been imposed, and yet, during this time, the consumers had been put to £100,000 of expense, because it was possible that some penalty might possibly be incurred. The learned counsel, having commented upon the respective items in the estimates put in, concluded for the day by remarking that the table submitted by the Imperial Company, by their own showing, proved that they could, if they were to work as economically in other things as the South Metropolitan, sell gas and make a dividend of 10 per cent. at a 3s. 6d. price. And there was this to be said—that they were a much larger company, and, if amalgamations were to be put forward as worth anything at all, and as lessening the expenses, a large company ought to have a pull over a small one. The general directors and officers were not, in any sense, according to the amount of the district they supplied, so expensive. Every miscellaneous expense ought to be somewhat smaller, in the case of a large company, than in a small one; but it was not necessary to go into those questions, as upon the Imperial Company's own showing, they could make gas at the price he had mentioned.

FRIDAY, JUNE 25.

Mr. CRIPPS resumed his address. He said, when the committee rose on the previous day, he had just been dealing with Mr. Chubb's table, which affected to show the difference between what would be required by the Imperial Company, in order to enable them to pay a dividend of 10 per cent., over what was required by the South Metropolitan. He said that he thought that was about the most instructive thing they had had, because it was a table put in by the Imperial Company themselves, and he wanted to rely upon that table, and show, taking it as their own statement, how the 3s. 9d. price to them would be

more than sufficient to enable them to earn their dividend. He was dealing with what could be done at the present time, with reference to present means; but that was not the whole question, because they were looking to the future, and the question was certainly not so much what was the actual cost of gas now, as what it would be, looking at a normal year, for the future. He did not want to insist upon what anybody might say as a mere matter of prophecy, but Mr. Burke's authority was certainly about the best authority produced, for he was a person whose attention had been called very much to this matter. Mr. Burke most decidedly in his evidence told them, speaking as a shareholder, and not representing others, that he would accept the 3s. 9d. from a conviction in his own mind that, in the course of time, the cost of gas would, from a variety of circumstances, be lower. He also said that there were several reasons which might make gas cheaper in the market. He (Mr. Cripps) did not want to pin anybody too much to a particular statement of that kind, but there were other circumstances, which he could allude to with great confidence, which tended to show that the price of gas would go down. He was not going to deal with any speculation so uncertain as what would be the future price of coal, or the future rate of wages; that was a matter which he did not think any witness could inform them of any better than they could inform themselves from ordinary circumstances and observation. The possible advance in the price of coal was one of the uncertain elements of the future about which it was hopeless to argue; all they could do was to make elastic machinery to meet the one event or the other, in case coal did either rise or fall. But there were some elements in the price of gas in the future which were certain, and which they could rely upon, all of them in favour of the probability of the lowering of the price. First of all, there was an increase in consumption, which been going on steadily for a certain number of years, at a rate varying in different companies from 4 per cent. to 8 per cent. per annum. And, further than that, there was this fact—that there was a considerable amount of district yet to be filled up, which was the district of most of the large companies where at present the consumers were thin, where, looking at the future, it might be expected they would increase, and be as numerous as in the very best parts of their districts. That must have an important influence upon the price of gas in the future, as it had had in the past. The price of gas had been getting gradually lower because, among other important causes, the area of consumption had been getting larger, and because it stood to reason that, the more persons supplied from a particular main, the cheaper it could be done; and, having got a certain amount of plant, and a certain amount of capital for producing a certain amount of gas, which would not materially be increased by the increase of consumption, they might look to that alone as a very important item in the probable future price of gas. But there was another matter, which was certainly far more important, and which would obviously have a great influence upon it, and that was the less charge proportionately for capital. It was in evidence that a very great portion of the excess of capital in some of the companies arose from an expenditure made many years ago, before the districting took place, when competition was going on, and when a considerable amount of money appeared to have been thrown away in duplicate mains, which were no longer necessary. In the future, with any further amount of capital, all that excess would be saved, and need not be expected to occur again. In other words, the extravagance in those matters had been most grievous, and could not be anticipated for the future. Then there is this further matter, which was perhaps more important than all, that the rate per cent. upon which future capital was to be raised for gas purposes, was to be materially less than it had been hitherto. He should have to contend presently that 5 per cent. would be ample for any new capital. Now, the capital of gas companies had doubled itself within the last ten years, according to the evidence given, therefore, looking forward to what was going to be done with future capital, the capital would cost the consumer and cost the companies considerably less per 1000 cubic feet of gas than it had done in past years. These, looking at the future, were certain elements for anticipating a reduction in the cost of gas; they were all certain elements that could be dealt with. He dismissed the uncertain ones; he said nothing about the economy of management from the great combination of the gas companies, which, however, ought to be something material. He said nothing at the present moment about the great stimulus to exertion which he hoped the decision of the committee would lead to. Those matters were more or less speculative, though tending in the same direction; but what he had then alluded to were pretty nearly certain elements for the future. He now came to the important part of the present proposition, which was the new sliding scale. When he introduced this bill to the committee the first time, he told them by the instruction of his clients that they would prefer not to have a sliding scale up and down, but would prefer their own proposition. At the same time they knew very well that he could hardly have argued for that proposition with the same confidence that he could for the present, because he certainly had ventured to say throughout that the logical conclusion of a sliding scale could not stop at a fixed sum one way or the other; and if the object of a sliding scale was to induce economy and care in the manufacture of gas, they did not arrive at that, and could not logically arrive at that by a sliding scale which went one way, and which stopped at a particular price of 3s. 9d. And he knew perfectly well, as the chairman put it to him when the committee rejected the scheme of the promoters, that their witness, Mr. Livesey, would not support one part of that proposition. They did not for that reason, however, refuse to put Mr. Livesey in the box. He thought it right and fair that such an independent witness should have an opportunity of stating exactly what his own opinions were, and he gave his opinion decidedly against the original proposition, and in favour of the proposition now in the bill. He could hardly mention Mr. Livesey's name again, without stating in his favour, after the somewhat unmitigated abuse put upon him, that the chairman himself, at the close of his evidence, or during the latter part of his evidence, expressed his own opinion of the extremely fair and straightforward way in which he gave his evidence, and thanked him for what he had said.

The Chairman: I think I may say, after all we have heard since, that it remains not only the opinion of myself, but of my colleagues.

Mr. Cripps said that was satisfactory to Mr. Livesey, because it could not be pleasant, however much they might disregard other people's feelings, to be designated as a traitor to his cause, and as Queen's evidence; but he would not allude to that further. They knew it was Mr. Livesey's opinion, and they knew they could not get much from their other witness, Mr. Stevenson, in favour of the argument of those who managed the matter on behalf of the consumers, why they thought the price should stop at 3s. 9d., and not be a sliding scale up and down. Those arguments were perfectly immaterial to refer to now; he only said that the committee must not suppose that his opinion was strictly right at the time, though there was a great deal to be said in favour of the proposition. It was not worth saying anything about it now, but it never had been his opinion that they would stop at the 3s. 9d. price.

The Chairman: It would be rather valuable information to us if we knew why your clients were anxious to stop at 3s. 9d.

Mr. Cripps said he supposed it was no use saying *de non apparentibus et de non existentibus eadem est ratio*. At all events he would assume, after the opinion of the committee in the matter, that their views were mistaken, and that they were not sound. Now, it appeared to him, and must appear to everybody, that the sliding scale was the only mode that had ever been suggested calculated to attain their end; that end being to find something that should give the company a continued stimulus to exertion over and above any pressure which might be brought to bear upon them by the Revising Commissioners, or anybody else from without. At the present time, if they could pay with the 3s. 9d. price, or any given price, their 10 per cent., every single sixpence beyond that belonged, not to the company, but to the consumers. It was entirely consumers profit beyond that, and whether it was paid over to them in so much money by the company, or whether they got their gas so much cheaper, was immaterial; it was a consumers profit beyond that 10 per cent., and yet it was a profit which they had no power of managing or dealing with, or having a voice in in any way whatever. The company and their servants and officers, who had no interest in it whatever, were the persons who were really managing on behalf of the consumers, who had the real interest in it. Their servants were elected and chosen by the company, and their first duty was to the company. The obvious thing appeared to him to be to give the companies still an interest in increasing the profit over 10 per cent. In other words, the consumer offered now by this sliding scale to give up a portion of that which was his under legislation, and let the company have a share of it, in the hope that this inducement would lead to the total being made larger by the care and diligence bestowed—an offer which appeared to him a most liberal one. The tables appended to Mr. Cardwell's report of the gradual improvement in the property of the companies and their dividend, just about the time of 1860, were most instructive upon the point. Those tables showed that, as soon as competition was removed, and the companies had a stimulus given to them that, without any fear of inducing competition, they might divide 10 per cent. in about two years, they did it. And they not only did that, but in many instances they contrived to pay back dividends in those years. But, having arrived at 10 per cent., and finding themselves safe, they had remained at that dead level ever since. There is no further stimulus to exertion, and all that had been done was a very small reduction—in some cases, no reduction at all—in the price to the consumer, but nothing like in proportion to the way in which their dividend shot up under the stimulus that they had to make the best for themselves in 1860. Why had it remained? Mainly and undoubtedly because there had been no great stimulus applied. There was no inducement to do more, and they had not done more. There could be no doubt whatever that as soon as that stimulus was again applied, the same thing would take place; the whole of the consumers would be benefited by having the price of gas reduced, and the companies would be largely benefited by being able to divide a higher rate per cent. Now, the extraordinary thing was that they had really very little opposition from the companies in this matter. The Commercial Company assented to the present proposition.

Mr. Venables: No, I have not said so.

Mr. Cripps: My learned friend, Mr. Venables, is not the only person appearing here on behalf of the Commercial Company. Mr. Pope, in his speech on behalf of the Commercial Company, says: "In the course of the discussions which have arisen upon the Commercial and Ratcliff Bill, we have expressed ourselves to the Metropolitan Board, and when that bill comes on, shall, of course, express ourselves to you as willing voluntarily to submit to the general conditions and regulations which they have thought desirable should be submitted to you. Therefore, that being our position, we shall be, when our bill comes on, necessarily involved in a discussion as to what conditions and regulations would be right and proper, in order that we might obtain the bill which we seek. I do not think it would be right that we should now intervene to discuss the general question, when we are not independent in the view we have taken as to our own relation to such regulations. When the Commercial and Ratcliff Bill comes before you, then, we think, will be the time when we can advantageously discuss what those regulations and arrangements and conditions should be, and then we shall be prepared to furnish you with all the information necessary in order to meet the suggestions in the letter of the Board of Trade. We therefore think it more respectful to you, and fairer to the associated companies, and in good faith to the Metropolitan Board, that we should stand aside from the present discussion."

Mr. Venables: That is quite correct; I should have said exactly the same. When we bring forward our bill we shall be ready to submit to these regulations; therefore we think it better to stand aside during the discussion of this bill.

Mr. Cripps said a more important witness in the matter than his friend, Mr. Pope, in his speech, was Mr. Burke, who, in his evidence, said: "Taking my own company, if I speak as a shareholder merely, and not representing others, if I could ensure finality—if I could ensure that the Board of Works would keep good faith with me, and say it shall remain always the law—I would say, 'Grant it at once.'" Mr. Burke, with his great intellect, was, for the time being, tainted with this nonsense about the Metropolitan Board. What did this mean—"If I could trust the Metropolitan Board of Works"? What had they to do with the matter, except by their views before Parliament? It was Parliament who adopted this. His words were really, if they meant anything, "If I could ensure that Parliament would keep faith with me." The board were merely the parties, on behalf of the consumers, to put before the committee their views; the committee heard them, and were the arbiters to impose conditions, not the board. If Mr. Burke could not trust Parliament, who was he going to trust? He admitted that there must be regulations if there was to be a monopoly; who was to impose them? It was not to be left to the companies to impose them themselves. They objected to the board reasonably enough. The board, however, did not assume to have the power. If the regulations were put in, they were put in by the authority of Parliament, and what Mr. Burke really meant to say was, "Speaking as a shareholder, I accept it." That was what he said, so far as it was sense. To go on further, and say the only reason was that he did not think Parliament would keep faith with him, was to raise a question which it was not worth while to discuss further.

The Chairman: I think that the impression which Mr. Burke made upon my mind (and I paid a great deal of attention to that answer) went further than that, and it was this, that, inasmuch as there was great inconvenience (to use a mild term), according to his experience, from the agitation of the Board of Works, representing the consumers, if he could feel sure that there would not be a renewal of the agitation, and a revocation of the concession of greater dividends at a lower price, he would be disposed to look at it in a different way.

Mr. Cripps: Quite so; I think Mr. Burke told us of the extremely powerless condition of anybody expecting to lay a proper way before Parliament. We can do nothing whatever. We have no power in the matter. If you do not think that what we propose is fair, you will not put it upon them.

The Chairman: I make this remark, that I think it is an element for us to consider, whether we are or not entirely convinced that, in making the proposal, the Board of Works and the Corporation do it with a full knowledge of what it means, and so far as they, as individuals who may be re-elected, or not re-elected at all, can speak on behalf of the constituency, say they have an intention of abiding by it.

Mr. Bristowe: That was my impression of the evidence of Mr. Burke, and I think the other members present agree with what the chairman says, that the tendency of Mr. Burke's evidence was precisely in that direction.

Mr. Cripps said it was the tendency of his evidence, and the tendency of the evidence of the other gas directors and chairmen. He was quite aware of their views about what the Metropolitan Board and the City of London had done; and it was impossible to convince them that those parties were mere representatives of the consumers, and were merely discharging their duty to the consumers with fairness to them. It was hopeless to expect companies to look at the matter in that light, and that introduced a great deal of the difficulty. But they must be satisfied that what was done could be done only by the authority of Parliament, and when once done could only be altered

by Parliament. It must be Parliament reviewing its legislation, and not the Board of Works or anybody interfering.

Mr. TALBOT: The impression upon my mind has been that there has been an uneasy feeling, not only that Parliament may eventually interfere, but that there may be pressure put upon Parliament to interfere. We know that there are people bringing in bills which do not pass, but still the bringing in of bills is enough to agitate and disturb the minds of the people against whom they are directed.

Mr. CRIPPS: That is a thing which we cannot prevent. It is impossible to look forward to the future, and say what may happen. We can only legislate with every possible regard to the result, and with every possible regard for the truth.

The CHAIRMAN: I make this remark now, though it is before we have formed an opinion as to this important part of the matter; but I think you might present it in a little more favourable way before us, and also before the companies, if you were to consider whether some words could not be inserted in the bill, showing that it was your belief that this was a just arrangement, and especially the power of getting more than 10 per cent. under certain circumstances. Whether there could not be some words put in that would record rather strongly that opinion, I think that is for you and your clients a little to consider. I make the suggestion without consulting my colleagues, because we do not want to give the impression that we have in any way made up our minds in so important a matter.

Mr. BIRLEY: In fact, some words which are the essence of your argument in favour of the sliding scale.

Mr. CRIPPS: We hope that this sliding scale, which is now conceded by the consumers, will be a settlement of the matter; when you ask me to look a century on, we cannot do that.

Mr. BIRLEY: It would be competent for any representative of a metropolitan constituency to agitate the question.

Mr. CRIPPS said he assumed in that case that Parliament would deal with fairness in the question; and if it was not dealt with in fairness, there would be an opportunity for the other side being heard with everything they had to say. It seemed to him that this scheme had as much promise of finality as any arrangement could have. He could hardly fancy any scheme better devised for the purpose, not only of doing justice between the parties, but of preventing dissatisfaction to either party, because, as he said on the previous day, abstract justice was of very little use, unless all the parties were satisfied that justice was done them. But it appeared to him the consumers would feel the benefit the moment that the companies felt the benefit also; and it was very unlikely that, under the circumstances, they would object to the companies making a larger dividend when they were receiving a share of what was produced by that company. He could not think it altogether immaterial, in the consideration of this matter, that the matter came to the committee recommended by a gentleman who had paid great attention to it.

The CHAIRMAN: I should demur to your putting it merely on the opinion of the gentleman who signed the letter, however much we should consider his opinion worth having; but the suggestion came to us from the Government.

Mr. CRIPPS: Mr. Farrer has been in the Board of Trade some time, and this has been a question before the Board of Trade from the year 1866, when there was a suggestion that the Board of Trade should bring in a bill upon the matter. They have now deliberately given their opinion as to the solution of the matter which they think is right. Of course I know that you will not pay any attention to the nonsense which my learned friend, Sir Edmund Beckett, talked about Mr. Farrer, the enemy of the company, sitting at the Board of Trade, he having had a go at railways this session, or anything of that kind. He is the responsible head of a department, who can have no more idea of desiring to do injustice, or to do anything but what is perfectly impartial, than any other person.

The CHAIRMAN: From my own experience of departmental work, I do not consider this to be Mr. Farrer's letter; it is Sir Charles Adderley's letter on behalf of the Government.

Mr. CRIPPS: Yes, just so. I have throughout this matter felt assured that the abuse of this or that man will never have the slightest effect on the deliberations of this committee; and I have been perfectly willing throughout to treat them with the most absolute indifference.

The CHAIRMAN: It is perfectly natural that Sir Edmund Beckett should disapprove of this letter, and that you should approve of it.

Mr. CRIPPS said it came upon a preconceived notion of his, and therefore very likely he should approve of it; but whether he approved of it or not, he should treat it with the respect due to an official communication of that kind. He had never suggested that it was dictated by anything else than a desire to do what was fair between the parties. But, unfortunately, he was not imbued by the feelings in this case which those opposed to the Metropolitan Board seemed to have taken up. The letter spoke for itself, and he would not allude further to it. But there was another important result of this sliding scale which he would call attention to—viz., its bearing upon the raising of future capital. The future capital of the companies, if it was to increase in anything like the proportion of the last 12 years, was a matter deserving the greatest possible consideration. Now it seemed to him that the sliding scale met the whole difficulty of the new capital. It made it perfectly secure that it should be raised at the lowest possible amount, and that the consumer and the company would share any benefit that was derived from that circumstance. Of course, the lower the rate at which the capital was raised, the larger would be the profit upon the amount of capital which stood at the present time. If the new capital was raised at 4 or 5 per cent., the time must much more rapidly arrive when the 10 per cent. upon the old capital could be extended, and the moment that that time came, the consumer and the company would become sharers in the additional profit; so that the cheaper the capital could be raised, the better for the consumers and the company also. It might enable them, if they could raise it at 5 per cent., to divide 12 or 15 per cent. in a very short time, at the same time reducing the price of the gas to the consumer, and admitting him thereby to a share of the profit. It would be the interest of the Metropolitan Board, as representing the consumers, to aid in any way in raising capital at the cheapest possible rate, because it would thereby remunerate the consumer. He believed he had very nearly come to an end of what he had to say, and would for a moment recapitulate what the propositions were. The promoters desired to get rid of the revision clauses, and they desired to substitute for it the sliding scale, which they thought perfectly fair, at any rate to the company; and the consumers, as represented by them in this matter, were perfectly willing to concede it. They thought also that the initial price of 3s. 9d. was a just and fair price; and they felt that it was absolutely essential there should be means of testing what it was that the consumers were giving money for. There were other matters of minor importance to which it was not necessary that he should now call attention, but as to the matters of great importance, the matters of preamble, to which he had already called attention, he hoped the committee would be able to pass the bill which was asked in the interests of the consumers. It was perfectly satisfactory to them, and would give full justice to the gas companies themselves.

The committee having consulted,

The CHAIRMAN said he was told that the general custom with public bills was that the preamble was postponed to the end, but this had not been the custom with a bill of this description referred to a committee in this way. It was, however, the opinion of the committee that as a whole it would be more convenient to take the question of preamble first. There was one matter not touched upon by Mr. Cripps in his speech—viz., the deviation from the preamble of the bill for general uniformity, so far as the South Metropolitan Company were concerned. The committee would like to know whether it was still intended to introduce a clause, and if so, the exact words to be brought forward.

(To be continued.)

Legal Intelligence.

GLASGOW COURT OF SESSION.—SECOND DIVISION.

SATURDAY, JULY 10.

THE WATER SUPPLY OF GALASHIELS.

This was an action brought upon petition by the Board of Supervision, to compel the Local Authority of Galashiels to introduce into the burgh a proper supply of water for both domestic and sanitary purposes, as acting under the Public Health (Scotland) Act of 1867, and the Public Health (Scotland) Amendment Act of 1871. When the case was first heard by the court, in December last, the local authority made a judicial admission of their duty to take immediate steps for the introduction into Galashiels of a supply of water for both the above-mentioned purposes; and their lordships, in respect of that admission, continued the case until the 1st of March last, in order that the local authority might then report to the court what steps they had taken for that purpose. The local authority, at that time, reported the result of steps which they had taken to ascertain whether the proprietors and millowners interested in the Caddon and Luggate waters (from one of which sources they looked to get the proposed water supply) would consent to a private adjustment of their claims of compensation for land and water, in the event of one of the schemes being fixed upon. Out of 27 proprietors and millowners interested in the Luggate, six acquiesced in a private arrangement, two desired further information before deciding, and 19 returned no answer; while, in the Caddon district, four out of six proprietors acquiesced in a private adjustment, one wished for further information, and one returned no answer. The local authority, in these circumstances, adopted the Caddon scheme, and resolved to take the necessary steps for carrying it out, and to obtain the compulsory powers for the work rendered necessary by the refusal of Mr. Pringle, of Torwoodlee, to agree to a private adjustment of his claims. The court adjourned the further hearing of the case, to enable these steps to be taken, and for report thereon. Since then the local authority have reported to the court a difficulty in the carrying out of their plans, and resolutions raised by the contention, taken up by some of their number, that they have no authority, under the Acts already mentioned, to introduce water for sanitary purposes, and the determination of many of the ratepayers in the burgh to resist, either by suspension or otherwise, payment of the assessment which would be levied to defray the cost of introducing a supply of water for such sanitary purposes. The local authority stated their apprehension that the ratepayers would be successful in this resistance. They, however, added that they had not ceased to go on with the steps necessary for bringing in the double supply, pending the judgment of the court upon this difficulty, and had had reports and plans from Messrs. J. and A. Leslie, civil engineers, Edinburgh, and Mr. Bell, C.E., London, on two alternative schemes of water supply from the Caddon.

The case came before the court on the 19th ult. upon a minute and report of the local authority, and it was then remitted to the Messrs. Leslie "to report to the court such scheme as they may consider most suitable for introducing into the burgh of Galashiels a sufficient supply of water for domestic purposes—such plan to be adapted, as far as possible, for the future introduction of an additional supply, should that be required for sanitary purposes."

The court to-day received, and sent to the summer roll for early debate, the report of Messrs. Leslie, under the recent remit to them in this petition. Messrs. Leslie report that they have had considerable trouble in drawing a line of demarcation between domestic and sanitary purposes, without some general directions as to the definition. They have always considered, and in practice have treated all, or almost all, of the domestic uses of water—including washing, baths, water-closets, &c.—as being also strictly sanitary; and if a town were adequately supplied with water for domestic purposes, and there were little or no waste, they did not see for what other purposes purely sanitary water could be required, unless for flushing sewers, which could only be wanted in the case of the sewers being badly constructed, or with very deficient fall. A sufficient domestic supply ought to be fit to keep all well-arranged sewers open and clean. They do not know whether the watering of streets and gardens are reckoned sanitary purposes. The watering of streets, occasional flushing of sewers, and putting out of fires are generally charged on a public rate, and not on a domestic one; but they do not know that the putting out of fires is always a sanitary measure. They do not think that a prior scheme and relative estimates prepared by them for the Water Commissioners of Galashiels for a domestic supply for Galashiels of 600,000 gallons per day from the river Caddon could be advantageously altered or materially cut down; and taking into account the great increase in the population between 1861 and 1871—namely, 60 per cent.—and the demand likely to arise for water for public baths and manufactures (which, under section 89 of the Public Health Act, the local authority are entitled to supply in the event of there being a surplus), they would not recommend that they should be cut down at all. A smaller quantity—namely, 500,000 gallons per day—might, however, serve for the present, and probably up to 1891, when the population, if increasing at the past rate, would be above 20,000. A supply of 600,000 gallons per day would be more than enough at first for purely domestic purposes, and part would be wasted unless it was to be used for flushing and other purposes. When the population should have increased to such an extent as to require for purposes exclusively domestic the whole of the water provided, then another pipe might be laid from Knowes Dean to the town cistern fit to carry all the water which could be required for purposes sanitary, but not domestic. An immediate saving by having a pipe fit to bring in only 500,000 gallons per day—being a supply of 25 gallons per head of a population of 20,000—instead of 600,000, as proposed by the Messrs. Leslie, would be £510; while another pipe hereafter to bring in an additional quantity of 100,000 gallons per day, for purposes exclusively sanitary, would be £2050, showing a balance of £1540 of loss in the event of such delay. In conclusion, they state their decided opinion that it is expedient and advisable to carry out the entire scheme from the first, as originally proposed, and without any reduction. There is appended to this report the prior report to the Water Commissioners in April last, stating the general reasons which led the Messrs. Leslie to prefer the river Caddon scheme. From the tests applied, they found that the minimum flow of the Caddon was not less than 810,000 gallons per day, and they could recommend the adoption, as the best and shortest route for bringing the water into the town, the one through Knowes Dean and by Torwoodlee. A clear water reservoir could be constructed at Knowes Dean at comparatively little expense, by means of an embankment across its lower end. This reservoir could have a capacity of 6¼ million gallons, or ten days supply, at the rate of 625,000 gallons per day. The length of pipe from the intake dam at the river to the town cistern would be 5½ miles, and the pipe would be capable of delivering into the Knowes Dean reservoir 1¼ million gallons per day, or twice an average supply. The total cost of the works for a supply of 600,000 gallons per day would be £15,750. On the question of compensation to the riparian proprietors, &c., the Messrs. Leslie state that, in the event of a water compensation being agreed to, a reservoir to provide for the water compensation, with a capacity of 75 million gallons, which is equal to 125 days storeage of the town supply, would cost £8850; and with a capacity of 141 million gallons, or 230 days storeage of the town supply, would cost £12,750.

BRISTOL POLICE COURT.—THURSDAY, JULY 9.

(*Before Messrs.* NASH *and* FUIDGE.)

CONVICTION OF A LAMPLIGHTER FOR NEGLECT OF DUTY.

Edward Bolvin, a lamplighter in the employ of the Bristol United Gaslight Company, was charged, under the Masters and Servants Act, with failing to comply with the terms of his engagement by neglecting to light certain lamps situated in his district, in consequence of which the company claimed £5 as compensation.

Mr. BRITTAN, who appeared for the company, said this was an important case, inasmuch as, if such conduct was repeated by the other men who held similar situations, the company would be liable to heavy penalties for failing in their contract with the corporation to provide light in the streets. On the 2nd inst. the prisoner became drunk whilst out on his rounds, and neglected to light the lamps in Wellington Park, Durdham Down, Pembroke Road, Apsley Road, Anglesea Place, &c. The defendant was an old servant, and had been with the company for a long time, but unfortunately, at times, was addicted to intemperance, for which he had been reprimanded and suspended on one or more occasions; but, owing to his large family, the offence had been overlooked. The company, however, felt that they could not overlook the present case, and, in their own interests, were compelled to bring the matter before the bench, as, on the day in question, the number of lamps which the defendant had neglected to light amounted to 100. The case had also been brought forward more as a warning to other lamplighters than to press for a heavy penalty. Taking into consideration the defendant's family and length of service, he did not wish to press the charge; but they (the magistrates) were the guardians of the public interests, and, if they thought the case should go on, he would proceed.

The MAGISTRATES having expressed their desire of hearing the evidence,

Police-constable 121 deposed that on the night in question he met the defendant at about half-past ten o'clock in Apsley Road, and seeing that he had not lit the lamps, asked him the reason. The defendant said there was no gas, and on being asked by witness where his pole was, he said he had thrown it away.

Police-constable 146 said he went to the defendant's house afterwards, and asked him to light the lamps, but he refused to do so.

The *defendant*, in answer to the charge, said that the night in question was a very rainy one, and he had not been out long before he was wet through. The apparatus for lighting the lamps went out, and the box of matches that he carried about with him had become so saturated that he was unable to relight it. He called at several houses and was given some lights, but he had not been out in the streets long before the apparatus went out again; and he then went home.

The MAGISTRATES said that, notwithstanding what Mr. Brittan had said on behalf of the defendant, they could not allow such conduct to pass by without notice. Their sentence was that the defendant should be fined 10s. and costs, or 14 days imprisonment, with hard labour.

Miscellaneous News.

EUROPEAN GAS COMPANY, LIMITED.

The Annual General Meeting of this Company was held at the Offices, No. 11, Austin Friars, London, on Wednesday, June 14—WM. WHITE, Esq., the chairman of the directors, presiding.

The GENERAL MANAGER (Mr. H. M'L. Backler) commenced the proceedings by reading the notice convening the meeting, and the following report of the directors:—

Gentlemen,—Your directors have the satisfaction to lay before you the following statement relating to the establishments of the company.

The favourable circumstances to which your directors alluded in their last report—viz., a large reduction in the cost of coals, and a partial revival in the trade of France—have fully realized the expectations formed at that time as to their effect on the accounts of this company.

The expenditure of capital has been strictly limited, with due regard, however, to efficient working, and a prudent provision for such further development of the consumption of gas as may be confidently anticipated.

At Amiens the coal storeage and purifying power have been increased, and a new exhauster and engine provided, as already announced.

A concession for lighting the suburb of Camon from the existing Amiens works has been obtained, and pipes are now being laid down for the purpose. The rental of this station will thus receive some addition at once, and in a larger proportion later, when the advantages of gas become more appreciated in this locality.

At Boulogne small works are being erected for lighting the outlying districts of Outreau and Le Portel, for which exclusive privileges were recently granted to this company, and which could not be supplied economically from the Boulogne gasholders.

At Caen the new gasholder is in progress, and must be completed according to contract at an early date.

The demand for gas is increasing rapidly at Havre, and, notwithstanding that three double benches of retorts were constructed last year, a new retort-house will soon be necessary, as also an additional gasholder and other extensions, for which the outlay of capital will be considerable.

A siding from the Western of France Railway has been laid down into the company's premises, and the saving thereby effected, principally in the carting of coke, is such as to partially compensate for the fall in value of that product.

New offices and workshops have been erected, on a scale commensurate with the growth of this important station.

At Nantes the house formerly used for offices and manager's dwelling had become dangerous, owing mainly to original faults of construction. It has been rebuilt, with due regard to the health of the company's staff, and in view of a prospective larger business.

One of the two gasholders only having been telescoped, it is now advisable to take steps for doubling the capacity of the other, so as to provide storeage for the constantly increasing sale of gas.

The returns from Rouen would be perfectly satisfactory if your directors had not to report a judicial decision adverse to the company.

During a violent storm which occurred last winter, a small dilapidated house of light construction, situated in the Ile Lacroix, was blown down, and three persons were buried in the ruins. Of these one only survives. The representatives of the family brought an action against this company, alleging, in support of their case, that the fall of the house was attributable to an explosion of coal gas.

Your directors, feeling convinced that such could not be the cause of the calamity, determined to resist what they consider an unjust demand, but the plaintiff has succeeded in obtaining a verdict for damages in the first court.

Summary.—The total net profits at the six stations for the year ended March 31, 1874, were £36,409 8s. (including £6877 13s. 11d. exceptionally realized by the sale of surplus coals), and on March 31 last £53,368 5s. 11d., being an increase of £16,958 13s. 11d., of which £10,549 7s. 3d. is provided by the difference in the amounts charged for depreciation and redemption in the respective years, the allocation in this respect being, however, still amply sufficient to cover all ordinary contingencies.

With this surplus in hand, your directors are able to declare a dividend at the rate of 9 cent. per annum on the entire share capital of the company, less 4 per cent. paid *ad interim* on the 1st of February last, leaving a balance of 5 per cent. to be paid on the 31st inst., for which warrants will be forwarded as usual on the previous day.

It must be observed that, owing to the recent creation of new shares, which were allotted to the shareholders, with £5 credited as paid, but on the actual payment of £1 only, the sum now necessary for a division of 9 per cent. is £13,043 17s. in excess of that required last year to pay 10 per cent.

After making due provision for the dividend thus recommended, a balance of £3179 12s. 4d. will remain to be added to the general revenue account, or reserve of undivided profits.

Your directors believe that a result so favourable on the first year's working, with a reconstituted capital, part of which was issued on conditions highly advantageous to each individual shareholder, cannot fail to afford great satisfaction to the proprietors generally.

It is gratifying further to report that the rental of the company is increasing in a greater ratio than usual, and that the coal supply for the current year has been secured on terms considerably lower than those paid during the past twelve months.

Under these circumstances it would appear almost superfluous to add that the prospects of the company are excellent, and that a notable improvement is already perceptible in the returns of the present financial year.

Notice has been given that two of your directors, Henry Solomon, Esq., and William White, Esq., and both auditors, William Jones Lewis, Esq., and George Harrison, Esq., retire from office at this meeting, but, being eligible, will be proposed for re-election.

The CHAIRMAN: Gentlemen, after the highly favourable, and, to my mind, satisfactory, report just read, it does not appear at all necessary that I should say much to induce you to adopt that report. I stated at previous meetings that the increase of capital, of which every shareholder has received his proportion—that is to say, an allotment of share per share upon which £5 was credited, although only £1 was paid—must necessarily reduce the ratio of profit to capital; but I ventured to say, at the same time, that I had reason to believe the dividend of 8 per cent. would be maintained, and that, in fact, it wa possible some small bonus might be paid in addition. But I suppose the most sanguine shareholder would hardly have ventured to reckon that we should be able, after making such an addition to our capital, to pay a full 9 per cent. upon both the old and new shares, and still leave a balance of more than £3000 to carry to the credit of undivided profits. We have thought it proper no longer to make a distinction between dividend and bonus, because we feel that whatever reason there might have been for such a distinction in former years, it is now unnecessary in our case. But I say to you distinctly and clearly that all we now divide is profit well earned, after making the fullest reserve for every contingency; and as the word bonus has been found to puzzle trustees, as causing them some doubt whether it is to be regarded as a division of profit or a return of capital, we have resolved to abstain from using that ambiguous term for the present, at all events, and to speak of dividends only. At the same time I must remind you the rates of dividend payable on the 1st of February and the 1st of August respectively will most likely be different, because, as many of the shareholders are aware, in the early part of the year we are not able to ascertain what the actual amount of profit will be, and therefore we are always disposed to pay less than more. I may add that we have been very sparing in our expenditure on capital account during the last two or three years, but now that business is fast recovering in the towns in which we are interested, and the consumption of gas is rapidly increasing, it may be necessary to incur some fresh outlay in the extension of our work. This expenditure will be the consequenee of our growing prosperity, and cannot, therefore, prove a drag upon the undertaking. We have made very satisfactory contracts for the current year for the supply of coals, as also with regard to freights, and I believe I may safely say that the affairs of this company were never in a more flourishing condition than at the present time. Of course, we have drawbacks at some of our stations, but I will only now mention Havre, as the outlay there will be specially heavy for two or three years to come. Reference has been made in the report to the legal proceedings at Rouen, on account of the alleged explosion. We think justice has not been done to us, but as litigation is still pending it will be prudent not to say anything more at the present. I will therefore only mention that whatever the final decision may be with regard to this affair at Rouen, we have taken care that no charge for the same shall be a burden upon the future years of this company. It only remains now for me to say that I shall be most happy, before putting the motion for the adoption of the report, to hear the remarks of any shareholder who may wish for further explanations. I will, as a formal matter, move—"That the report of the directors now read be received and adopted."

Mr. FAWCETT seconded the motion.

A SHAREHOLDER: As you say that you want more capital, may I ask whether it is likely that you will make a call during the next six months?

The CHAIRMAN: No. Perhaps I might give a little explanation on the point. In consequence of the great decrease which has taken place in the value of coals and other materials, our trading capital will not require to be so large, and therefore we shall be able to make these outlays with the money we have in hand, without calling upon the shareholders—that is my impression.

The motion was then put and carried.

The CHAIRMAN: I have now to move—"That a dividend at the rate of 9 per cent. per annum be declared on all the shares of the company, according to the amount paid thereon, and an interim dividend at the rate of 4 per cent. having been paid on the 1st of February last, that the balance, at the rate of 5 per cent. per annum for the half year, be paid on the 31st inst., the whole out of interests and profits, and free of income-tax."

Mr. FAWCETT seconded the motion, which was put and carried.

On the motion of the CHAIRMAN, Mr. Solomon was re-elected a director, and on the motion of Mr. FAWCETT, the chairman himself was re-elected.

The CHAIRMAN: Gentlemen, I am much obliged to you for again re-electing me. I hope I may be yet spared a few years to do suit and service for the company as I have done in times past. During the 27 years that I have been on the board, it has been no mean work, especially at the commencement of that period, to carry on the affairs of this company, and to bring it into the position it now occupies. With the co-operation of the other directors I have endeavoured to do my duty, as I always endeavour to do in the interest of any cause in which I am engaged.

Mr. SOLOMON: I beg to return you my thanks for your kindness in re-electing me as a director. I have gained great experience since I have been on the board, and my best efforts have been exerted on behalf of the company, and I hope with my friend, Mr. White, to see it even in a more prosperous condition than at present.

On the motion of the CHAIRMAN, Mr. W. J. Lewis and Mr. George Harrison were re-elected auditors.

Mr. STOKES: I believe, sir, this is the whole of the business; but before we leave we must certainly give you and the other directors a hearty vote of thanks for the able management of our affairs. Such results as have been reported to-day could not have been arrived at without great care, good management, and a deal of thought. Things have been well studied, as the results show. Twenty years ago, when I first attended the meetings of the company, our position was very different; but the concern has gone on wonderfully well. We owe this to the excellent manner in which our business has been conducted, and we therefore present you with our most cordial thanks.

Mr. ROAN seconded the motion, which was put and carried unanimously.

The CHAIRMAN: Gentlemen, it is very gratifying to your directors to receive this very hearty vote of thanks on the present occasion, and it is not the less welcome to us because we have so often had such votes repeated. We have, as I have stated before in this room, done all we could to increase the prosperity of the concern. This can only be done by looking well after your affairs, which I unhesitatingly say has been our constant study; and it is certainly a very pleasurable circumstance that, at our meetings, the shareholders do not forget that the directors deserve a vote of thanks. I assure you we appreciate this renewed mark of your confidence, and I trust that, for some years to come, we shall be able to show that we continue to deserve it.

Mr. STOKES: I think we cannot separate without also giving a similar vote of thanks to our excellent manager for the forethought and energy which he has displayed in the conduct of our affairs. Having known him for 20 years, I am sure he richly deserves such a recognition on the part of the shareholders.

Mr. OXENHAM seconded the motion, which was cordially adopted.

Mr. BACKLER: Gentlemen, I am much obliged to you for passing this vote of thanks to me. At the same time, I do not take the credit to myself of all that is done—very far from it. I think a great deal is owing to the valuable staff of officers we possess. We have on our staff men who have been in the employment of the company 37, and even 40 years; and the man who has

been with us 16 years only is considered quite a junior. This attachment to the company shows the way in which its officers are treated, and I assure you they reciprocate it by the earnest service they give in return.

The proceedings then terminated.

COLCHESTER GAS COMPANY.

The Annual Meeting was held on the 24th ult.—Mr. J. B. HARVEY in the chair, when the following report of the directors for the year ending the 31st of March last was presented:—

In presenting their annual report, the directors have the satisfaction to state that the application to Parliament for an amended Act has been successful to an extent which they believe will enable the company to realize the statutory maximum dividends, unless the price of coal should in the future exceed all ordinary calculations. Although it is not likely that coal will be again obtainable at the rates which prevailed prior to 1873, it may yet be hoped that there will not, for many years at least, be a return to the excessively high prices which operated so unfavourably in 1873 and 1874.

It is to be regretted that the company should have been involved in the costs incident to an opposed bill in Parliament. The directors did all in their power to save the company and the ratepayers from the ill-advised step on the part of the Town Council of prosecuting a petition against the bill, by repeatedly expressing their readiness to meet fairly any objections which might be made to their proposals. The opposition was, however, resolutely persisted in, without a single opportunity being afforded for an amicable settlement of the disputed points. And even after the committee of the House of Commons had disposed of the case on the basis of a fair compromise, the opposition was continued in the House of Lords, notwithstanding the protest of a large number of influential ratepayers against any further expense being incurred by the council in opposing the bill. It was thus made evident that the object of the opposition was nothing less than the entire destruction of the bill; but the committee of the House of Lords, after hearing the evidence on both sides, unhesitatingly confirmed the judgment of the committee of the House of Commons.

The amended Act, which has been thus obtained, although at a heavy expense, will, it is believed, be found worth the sacrifice, by the increased value and stability it must give to the property of the company, and the consequent security it will afford to shareholders for the profitable investment of their capital.

The principal features of the new Act are—

1. The power to raise £10,000 additional capital.
2. The increase in the maximum charge for gas to private consumers, from 4s. 3d. to 5s. per 1000 cubic feet.
3. The price of gas to the public lamps to be the same as that to private consumers.
4. The payment to the company by the Town Council of 15s. a lamp yearly instead of 13s. for lighting, extinguishing, cleaning, and repairing the lamps.

Several clauses, the result of gas legislation since the date of the Act of Incorporation, have been introduced into the amended Act, the most important being those which provide for the offering by public auction any shares issued after the passing of the Act; and for the rateable payment of dividends when the resources of the company are insufficient to pay the prescribed maximum rates.

The directors have not found it necessary to raise the price of gas to the maximum authorized by the new Act. The advance of 6d. per 1000 cubic feet will, it is believed, meet the wants of the company; and it is hoped that this increase will be but temporary.

The profits of the past year will enable the company to pay a dividend of 5 per cent., and the directors recommend the annual meeting to declare such dividend accordingly.

The retiring directors are Mr. J. B. Harvey, Mr. Thomas Catchpool, and Mr. Charles Coleman; and the retiring auditor is Mr. J. S. Barnes, all of whom are eligible for re-election.

On the motion of the CHAIRMAN, the report was unanimously adopted. Resolutions were carried, giving effect to the recommendations of the report, and the retiring directors and auditor were re-elected.

The following resolution was carried with acclamation:—"That the valuable services rendered by J. B. Harvey, Esq., in securing the success of the company's amended Act, entitle him to the earnest thanks of the shareholders; and, in tendering their thanks to him, the shareholders beg to request his acceptance of the sum of one hundred guineas, in testimony of their appreciation of his services, not only in connexion with the conduct of the bill, but during a long series of years as chairman of the company."

SHANGHAI GAS COMPANY.

[From the *North China Herald.*]

The Annual Meeting of the Shareholders was held at Shanghai on April 27 last—Mr. J. G. PURDON in the chair.

The SECRETARY (Mr. G. J. Yeo) having read the notice of meeting, the minutes of the last meeting were taken as read.

The following report of the directors was presented:—

The directors regret that, owing to the late illness of the secretary, the annual accounts were not presented a month earlier, as was intended, but they have now much pleasure in submitting them, and trust they will be found satisfactory to the shareholders.

The net profits for the year are Tls. 23,120.76, being a slight increase over last year, out of which two semi-annual dividends have been paid, amounting to Tls. 16,500.

Although the last half-yearly dividend was only 5 per cent., instead of 6 per cent. as formerly, it will be seen that this was more a matter of precaution than from any inability to declare the larger amount out of the profits of the year. The consumption of gas not increasing in the same ratio as in former years, the directors preferred to apply the sum thus saved towards more quickly liquidating the loan for the new gasholder, than to carry out fully their anticipation expressed in the last annual report of not having to interfere with the usual dividends; and they believe the shareholders will be of opinion that this was a wise policy.

To increase the quality of the gas, the directors have caused more Australian cannel coal to be used than formerly; and although this is a very expensive coal, they consider the money well applied.

Photometric tests are regularly taken at the works of the illuminating power of the gas, and during the past year the average has been equal to 14·2 sperm candles. The engineer will be happy at any time to show this testing to any shareholder who may wish to see it.

At the request of the Municipal Council, the company made a reduction of 12 cents per public lamp per month, and this year, to meet another request of the council, the directors have made an arrangement by which the lamps are lighted earlier in the evenings of the winter months, and put out earlier in the summer; and although there is an apparent saving of some hours in the year in the time the lamps are burning, yet, as the hours taken off are in the early mornings, when the pressure of gas is not so great in the settlement, and the hours added are in the early part of the evening, when the pressure is greatest, the arrangement is not quite so favourable to the gas company as the former one was.

Application was made to the council for a modification of the fines imposed on the company for lights out during the night. At present, for all lamps found not burning during any time of the night, no matter from what cause, a deduction of $2.65 per 1000 cubic feet of gas is made, and it is established by investigation of the company's servants that many of the lamps are put out through malicious practices; the company, therefore, not only get fined, but lose the gas which is allowed to escape. The council, however, refused to make any alteration.

The amount of coal used, state of the works, plant, &c., including the new gasholder, and other statistics interesting to the shareholders, are given in the engineer's annexed report.

The directors retire in terms of the deed of settlement, but are eligible for re-election. Mr. O. Brandt offers himself for re-election as auditor.

Summary of Engineer's Fortnightly Reports.

During the past year 3093 16-20ths tons of coal have been carbonized, giving a production of 27,330,400 cubic feet of gas.

A slight increase only of 69,000 cubic feet in the consumption of gas has taken place, this being a very small per centage as compared with former years.

The loss of gas by leakage during the year is 10·06 per cent., against 13·56 per cent. of last year.

The sale of coke has been very satisfactory, but the demand for tar has been very small, and this commodity is so rapidly increasing that in a few months more storeage room will be necessary.

The buildings, machinery, and plant generally are in good repair:—144 yards of 14-inch main have been laid in the Nanking Road in the place of some 8-inch pipes, the latter being utilized in the works; 235 yards of old 6 and 7 inch mains in the Nanking Road have been removed, and 9-inch mains substituted; 210 yards of 7-inch main have been laid in the Garden Bridge Road, and a portion of the Hongkew Road; and 164 yards of 3-inch, 168 yards of 2½ and 2-inch mains have been laid in the Bubbling Well Road, and other parts of the settlement requiring these extensions.

The new gasholder, of 70,000 cubic feet capacity, which the contractors expected to have completed by the end of November, has been delayed through bad weather during the excavations, and detention of materials from England, but the work is now progressing, and will be shortly completed.

[The statements of account accompanying the report are too long for quotation.]

The CHAIRMAN moved—"That the directors and engineer's reports and accounts for the year 1874 be approved and passed." He did not know that there was much to add to what was there said. The report was full—too full, perhaps, for those who do not like dry detail—but the directors were anxious to give all the information they could. The continued prosperity of the company was gratifying. Of course, the ratio of increase could not be expected to be so great in the case of an old as of a new company; but that there was an increase at all was satisfactory, especially in these times of retrenchment. The working of the company was all that could be desired. The directors had taken a great deal of personal trouble, and had carefully watched the outgoings. The accounts were in good order. The directors had enjoined care on the auditor, and he said books could not be better kept.

Mr. BISSET seconded the motion, which was carried unanimously.

Mr. HOLDSWORTH next proposed, and Mr. CAMERON seconded—"That Sir E. Hornby, Messrs. J. G. Purdon, E. J. Hogg, and F. D. Hitch be appointed directors for the current year, with power to add to their number." Carried *nem. con.*

Mr. HITCH said the shareholders were aware that a heavy portion of the duty of the directors fell upon the chairman. The directors could testify that he had borne the great burden during the past year. He wished to propose—"That, in view of the onerous duties which the chairman of the company is called upon to perform, he shall hereby be entitled to receive as his fee the sum of Tls. 20 for each directors meeting which he shall attend." The fee for the other directors remaining Tls. 10, as before. Seconded by Mr. F. G. WHITE, and carried.

The CHAIRMAN next proposed, and Mr. M'GREGOR seconded—"That Mr. O. Brandt be re-elected as auditor to the company for the ensuing year." Carried.

This concluded the business, and the meeting broke up.

EXETER WATER COMPANY.

The Annual General Meeting of this Company was held on the 21st ult.—Mr. R. SANDERS presiding.

The following report of the Committee of Management was read by the CLERK (Mr. Tripe):—

The committee have the satisfaction of being able to present to the shareholders a favourable report, both as to the present state of the works and the financial position of the company. The service from the reservoir at Marypole Head has now been in operation some time, and has been found to answer the expectations formed of it, and thus prevents an evil which has more than once been reported against by the late Mr. Simpson, the eminent engineer, that of pumping direct to the cisterns of the consumers. Under the present system a considerable district is now supplied from this reservoir, but the works have been so arranged that the supply could at any time, in case of necessity, be given direct from Pynes as heretofore.

Your committee cannot too strongly press upon the consumers who have their supply from the high-level reservoir, the absolute necessity of seeing that their pipes and apparatus are of sufficient strength to resist the extra pressure, and also that of keeping the valves and cocks in good order; as a leakage which, under the old system, occasions a comparatively small amount of water, becomes, in consequence of the extra pressure, a serious evil, and therefore compels the committee, when such leakage occurs, to put the powers of their Act into operation. As an example, if the usual supply-pipe of ¾-inch bore should be defective under the former system, the wastage might amount to 1600 gallons per hour, whilst under the high pressure for the same period the loss would be 6000 gallons; and when the additional cost of the water is considered, the necessity for a strict attention to the service-pipes and apparatus is obvious.

In stating that the works are in a satisfactory condition, your committee cannot but refer to a defect in the east corner of the Marypole reservoir, which occurred not long after the last annual meeting. This was occasioned by a combination of circumstances. No time was lost in remedying the defect by building counter-forts or buttresses, resting on the original solid ground, and your committee are assured that it is almost impossible a similar accident will again occur.

In their last report to the shareholders, your committee referred to the new boiler at the reservoir, which had been erected not only for the present engine, but for the duplicate engine when erected. The committee have now to report that they have ordered the duplicate engine, and they hope to have it fixed and working in about three or four months; and this, when erected, will complete the whole of the works contemplated in Mr. Dymond's report of February, 1870. The cost of these works—about £15,000—will be provided for out of the ordinary revenue of the company, with the exception of a floating debt of about £5000, and which the committee hope may be liquidated in the course of a few years.

In referring to the financial position of the company, the committee have to state that the rental has been maintained. The balance in the hands of the treasurer, as appears by the printed account circulated amongst the shareholders, amounts to £2264 12s. 5d., and they recommend that a dividend of 6 per cent. should be declared as heretofore.

The committee cannot conclude this report without informing the shareholders that they have again received a communication from the Town Council relative to the question of purchasing the works of the company, and, in reply, they have asked the council whether they are willing to enter into a treaty on the basis that the moneys expended by the company on new works since January, 1870, shall be considered and dealt with as capital of the shareholders, and that the amount of compensation to be paid or secured to the company should be ascertained by arbitration. The council have taken time to consider this subject; and until a definite answer has been received from them, your committee feel that they cannot offer any advice to the shareholders on the course to be pursued.

The CHAIRMAN, in moving the adoption of the report, made special reference to the last paragraph, which, he said, the shareholders would observe related to a letter received from the Town Council. This letter reopened the negotiations made some time ago with a view to purchasing the company's works. He was told—but he did not know how persons could so far mistake themselves—that the council did not understand their (the company's) answer. He believed that he put the matter as plainly as he possibly could. The company had expended £15,000 on new works—£10,000 in cash and £5000 borrowed. Therefore, what they asked the council to do was this—that they should add the £10,000 to the share capital of £50,000, which would make the shares £30 each instead of £25, and add the £5000 to the debenture debt, which now stood at £60,000. They had a right to demand this, because it must be remembered that all this money which had been spent out of income might have been appropriated to dividend. It was right that this should be borne in mind by the public, as it would show that the company had not been greedy of dividend. If their proposal were accepted, the Town Council would have to deal with a share capital of £60,000, and a debenture debt of £20,000. He should not say, however, supposing the council were willing to treat, whether it was desirable for the company to entertain the proposal. That was a question to be considered, and which, he thought, had better be left open. After referring to the general condition of the company's affairs, which, he thought, was a subject upon which he might congratulate the shareholders, he alluded to the great liability to waste in the higher service, owing to the pressure on the mains; and pointed out that defective pipes meant an enormous loss to the company. Therefore the public must not be surprised if they were more stringent than heretofore in visiting houses, and requiring that the service-pipes should be kept in proper order. He took this opportunity of saying that the company intended to insist that no pipe should be laid down on the high service above half an inch in diameter, or of less weight than 7 lbs. per yard. If thinner pipes were used, the great pressure would most probably burst them, and a tremendous waste might be occasioned before it could be discovered. He wished to

lay particular emphasis on this matter, as it was of great importance; and he hoped the public would co-operate with the company in doing what was necessary.

The motion for the adoption of the report was seconded by Mr. KENDALL, and carried, the clerk and the retiring directors were re-elected, and the usual votes of thanks terminated the proceedings.

HALIFAX (CORPORATION) GAS-WORKS.

At the Meeting of the Town Council of Halifax on the 7th inst., the following report by Mr. Hawksley was submitted:—

To the Chairman and other Members of the Gas Committee of the Town Council of the Borough of Halifax.

30, *Great George Street, Westminster, June* 24, 1875.

Gentlemen,—In compliance with your instructions, conveyed through the town-clerk, and supplemented at personal interviews with yourselves, I have the honour to present the following report on the several matters submitted to my consideration.

1. I have made a careful examination of the constructions connected with the manufacture and storeage of gas, and have received from several of yourselves and from your officers, and also from plans and papers furnished to me, all such particulars and information as I have deemed to be necessary for the purposes of my investigation.

2. The establisment is in general good condition and is in excellent working order, and has been so satisfactorily maintained that, with exception of certain articles of plant, now undergoing the process of usual repair, it may be pronounced to have suffered no appreciable amount of deterioration capable of detracting from either its structural or commercial value as a going concern.

3. The plant, buildings, and apparatus, with trivial exceptions, are also sufficiently complete to enable gas to be manufactured and delivered proper and sufficient in quantity, quality, and pressure, and at a reasonable productive cost. In some respects these works possess remarkable advantages, as for instance, in the means employed for the reception and storeage of coal, and also in the manner in which a somewhat contracted and highly inclined site has been adapted to the storeage and delivery of coke. The exceptions to which I refer are these.

(*a.*) The roofing of the purifying-houses are low, and of timber. I think they ought at some convenient time to be raised, and that iron should be substituted for wood.

(*b.*) The boiler-house, exhauster-house, and purifying-houses communicate directly the one with the other, and in some of them unprotected lights exist. Looking to the many cases of explosion which have occurred in the purifying-houses of gas-works, I recommend that the existing openings for intercommunication be securely built up, and that the buildings into which the gas is conducted be for the future lighted by means of external reflector lamps, so placed and guarded as to be beyond the range of accidental currents of an explosive nature. This precaution with respect to lighting should also be observed in the cases of the meter and governor-houses.

(*c.*) There is no apparatus in use whereby the illuminating power and purity of the gas can be satisfactorily determined, or the pressure at which it is delivered be properly recorded. The excellent system of manufacture and delivery adopted in the Halifax Gas-Works has no doubt enabled the habitual use of these instruments to be dispensed with, without the occurrence of importantly mischievous results. Nevertheless, in the present day, no gas-work can be pronounced to be perfectly conducted without a constant resort to those practical tests which experience and the Legislature have found to be essential for the protection of the consumers interests.

4. The coals used at the works are of a good gas-making quality, and produce a satisfactory amount of coke and other residual products; and the carbonization of the coal is effected by the consumption of a very moderate proportion of fuel

5. Owing to some cause not immediately or with certainty assignable, the production of the gas appears to be attended with an undue destruction of retorts. Retorts manufactured from a refractory fire-clay, well set, and carefully managed, ought to last about three seasons, or, in the whole, at least 500 working days. At Halifax the retorts appear to be habitually reset every year; but, on the other hand, it must be observed that they are home made, and are purchased at less than two-thirds of the cost of retorts manufactured at a distance, from the higher qualities of fire-clay appropriated to such purposes. This circumstance will not, however, entirely counterbalance the extra cost caused by the short life of the retorts as now used and worked.

6. The distillation is well conducted both as regards the production per ton and the production per mouthpiece. In the year 1874 about 26,000 tons of coal were carbonized, with a resulting yield of 247 million cubic feet of gas, and about 18,000 tons of coke, of which nearly 12,000 tons were accounted for by actual sales, the remaining third being consumed as fuel. As the quantity of coal charged into each working mouthpiece every six hours appears to average 2½ cwt., I calculated that the gas credited to each mouth in 24 hours amounts to fully 4600 cubic feet. And I also find that the gas evolved from each ton of the coal carbonized, consisting approximately of two-thirds local bituminous coal and one-third local cannel, amounts to 9500 cubic feet. The above results are to my mind perfectly satisfactory and I am quite sure higher gas-making results could not be obtained without an undue sacrifice of illuminating power and fuel.

7. I estimate, in the absence of direct experiment, that the average illuminating power of the gas thus produced was not below 18 candles, measured by Sugg's No. 1 standard Argand, or 16½ candles measured by the old, but imperfect, 15-hole burner. This intensity of light will probably be deemed sufficient, but, as in all towns in which gas is largely used in manufactories and dwelling-rooms, as in the case at Halifax, it is essential that the light should possess a certain amount of richness, distinguishable by its agreeable sunny tint, I strongly recommend that no endeavour should be made to obtain a nominally cheaper article, either by reducing the proportion of local cannel now used, or by increasing the quantity of gas evolved from a ton of coal. The recent high price of coal has very unfortunately had the effect of depreciating the quality of the gas supplied in many, perhaps in nearly all the towns of the kingdom, and has naturally produced an anxiety to obtain high yields, but with the necessary accompaniment of low illuminating powers. I am desirous to guard the committee against the commission of this mistake, inasmuch as I have heard that some opinions, mistakenly unfavourable to the management at Halifax, had been formed on partial comparisons of the Halifax results with results elsewhere obtained.

8. I entirely commend the system of purification adopted at Halifax. The gas is well washed, well condensed, and well cleansed from obnoxious compounds by a liberal employment of lime hydrate. I am very decidedly of opinion that lime alone is a better agent for effecting the final purification of coal gas than the iron oxide, now so commonly resorted to, or the combined use of both lime and oxide, in any proportions whatever; and I advise the committee to persist in the use of lime only, so long as the waste product can be disposed of with ease, and without incurring a positive cost of significant amount. By no other simple agent can carbonic acid, sulphuretted hydrogen, and nearly all the bisulphide of carbon be so effectually removed from the gas, thereby rendering it a commodity useable without injury to health, goods, or furniture, in inhabited appartments, shops, and manufactories. The lime employed is of the best description—Buxton mountain—and is used in the proportion which I have found to be capable of reducing the bisulphide to at 12 or at most 15 grains per 100 cubic feet; a quantity considerably below the usual parliamentary minimum. As, however, the establishment did not possess the apparatus necessary for the purpose of determining the residual quantity of bisulphide in the gas, I had no opportunity of arriving at experimental results. As such determinations ought to be regularly obtained in every modern gas-work of magnitude, I beg to recommend that this apparatus be added to the now requisite practical laboratory, and that the daily results of the examination of the gas for sulphur be duly recorded.

9. The engines, the boilers, the exhausters, the pumps, the station-meter, and governors, are good and sufficient for present purposes, and are exceedingly well kept. Nothing either in the character or condition of these important appliances calls for special remark.

10. The three gasholders, which together contain 1,628,000 cubic feet, are, or shortly will be (for one of them is undergoing the process of partial renovation), in excellent condition. Moreover, these vessels are, in respect of their capacity, fully capable of satisfying the requirements of a daily demand of two million cubic feet. As the daily consumption has now attained to about one and a half million cubic feet, and as an additional gasholder of competent size cannot be erected in less than two years, I feel justified in advising the committee that the time has arrived when it has become very advisable to proceed with the erection of a fourth gasholder.

11. The establishment is in general well provided with accessory vessels and appliances, and, so far as I could judge from observation, or from the descriptions rendered to me of matters placed underground and otherwise beyond the reach of immediate inspection, there is no deficiency of magnitude nor any known dilapidation.

12. I was much struck with and particularly remarked the facilities which have been recently provided for obtaining, delivering, and storing coals in connexion with the railway system, and I informed myself of the cost incurred (between £10,000 and £11,000). This outlay at first sight appears large; but, considering that the interest on the outlay and cost of repairs and maintenance will not amount to more than 9d. per ton on the coals brought by rail, whilst, on the other hand, not only is the cost of loading and cartage abolished, but all the difficulties and expenses of delays and demurrages incidental to the old method are avoided, and rapidity of transit both by the companies and the coal-owners waggons promoted, and also several other, though minor, advantages obtained, I am decidedly of opinion that the expenditure has been wisely undertaken, and that in the future very great and annually increasing benefits will be derived from it. Even immediately the corporation is fully reimbursed.

13. In connexion with this subject, I have to remark with much satisfaction that the corporation is now in possession of 30 railway waggons appropriated to the conveyance of coals from the pits mouths to the gas-works. The cost of these waggons is, of course, in addition to the usual capital of similar undertakings; but, having had much experience of these advantages gained by the possession of an independent means of conveyance, not only as a matter of resulting economy, but also as affording a command of supplies in busy times and often under emergent circumstances critically affecting gas-works, on occasions when the waggons of railway and commercial companies are not instantly available; and I have also found that coalowners will willingly submit more than proportionately reduced tenders, when they are relieved from the cost and responsibility of providing their own rolling stock.

14. Excavations and foundations of considerable magnitude have been recently provided for an additional retort-house, with coke stores beneath the same. As I find that the increasing demand for gas (suspended only for the moment) has nearly reached the capabilities of the undertaking, and having regard to the fact that two winter seasons will almost certainly be occupied in completing additional structures and apparatus, I regard this action of the committee not only as in itself a very prudent measure, but as a measure which it would have been very unwise to postpone to a later period. This work has been performed by contract, and at reasonable prices.

15. Besides the land now actually, and, perhaps, rather overcrowdedly occupied by existing buildings and plant, the corporation is in possession of other sites exceedingly well adapted for the future purposes of this growing establishment—notably a plot of ground containing upwards of 3000 square yards on the west side of the Hebble Brook—well adapted for the erection of future buildings and vessels for condensation and purification, but requiring to be specially protected against the intrusion of sparks and cinders projected from the locomotives travelling on the adjacent railway viaduct; also a plot of ground (also containing 3000 square yards) on the east side of the Charlestown Road, and capable of being directly connected with the Lancashire and Yorkshire Railway by means of an already proposed siding. This site is well adapted for its intended use as a place of deposit for pipes and other materials of distribution, and also for such additional workshops and store-rooms as will hereafter be required, and of which, indeed, there is some present need. Also a plot of ground near the cemetery, which, with the aid of a small addition from an unused part of the cemetery enclosure, will enable the large gasholder already mentioned to be duplicated. And also a large plot of ground at Salterhebble, containing more than 10 acres, purchased at a cost of £12,000 as a provision for future extensions, but now temporarily utilized without loss for other purposes. This plot is admirably situated, being at the lowest part of the district, and adjoining the Halifax branch of the Calder and Hebble Navigation. The possession of these sites confers an indirect value upon the undertaking, much beyond that which can be directly estimated, inasmuch as thereby the corporation is relieved from the parliamentary and local difficulties which almost invariably stand in the way of the acquisition of additional lands for the extension of gas-works. Nor has the corporation been too far sighted, inasmuch as the time is certainly not remote when the whole number of these sites will become more or less utilized for, and in connexion with, the service of gas to the rapidly augmenting community supplied by the Halifax Corporation. It would not, therefore, in my view be a just subject of complaint that these timely provisions for approaching requirements have, for the moment, increased the nominal amount of the capital account.

16. The works of distribution are unusually extensive, and therefore have been proportionately costly. This, however, is the unavoidable consequence partly of local peculiarities, and partly of the very liberal manner in which the corporation has caused the gas to be carried to all classes of the population, and to all parts of their district. I have always recommended gas suppliers (whether corporations or companies) to act upon the policy which has been so beneficially adopted at Halifax, nor have I ever known the adoption of this policy to fail in affording all but universal satisfaction to the community interested, either as suppliers or consumers, or, as in the instance of Halifax, in both these capacities. With regard to Halifax the case stands thus—that the total length of mains without the works is 91 miles, employed in the distribution of gas to a present population of fewer than 1000 persons to a mile of pipes, whereas most commonly the population of a manufacturing district amounts to from 1500 to 2000 persons per mile of pipes. Again, the quantity of gas conveyed through the pipes amounts to only 2¾ million cubic feet per annum for each mile of pipes, whereas, in the cases of many manufacturing towns, from 4 to 5 million cubic feet are averagely transmitted through each mile of pipes. The investment of capital in street work is, therefore, necessarily larger in Halifax than in many other towns which might, in ignorance of these circumstances, be hastily compared with it. Again, the rapid ascents and descents of the ground occupied by the borough of Halifax have led to the making of numerous special arrangements, of an unavoidably costly character, for the purpose of regulating the pressure and equalizing the distribution of the gas. And, lastly, the corporation has laid down and maintains more than 18,000 service-pipes, and has, at its own cost, provided, and has in use nearly 10,000 consumers meters. The outlays thus occasioned being all very properly charged to the capital account of the gas-works, but helping to swell its total amount.

17. In addition to the amounts with which the capital account of a gas under-

taking is debited for works of construction, there is always a considerable sum required for carrying on the business of the concern. Coals, labour, carriage, management, and various supplies of materials have to be provided, and, to a considerable extent, paid for before the receipts of the gas supplied by their means are come in. The amount of money thus employed is not usually capable of being accurately defined and separated from the general outlay, and it undergoes considerable changes, not only from year to year, but also at different periods of the same year. The working capital thus employed is, however, commonly assessed at about one-third of a year's income arising from the sale of gas, and may, I think, be fairly taken at £15,000 in the case of Halifax.

18. It is known to me as a practical fact, derived from a long course of experience and observation, that the total amount of the capital necessary to be employed in the constructions and working operations of a provincial gas-work, circumstanced like that of Halifax, is not less than 2s. 6d. per cubic foot of the quantities fairly capable of being manufactured and distributed in the usual course of business during a mid-winter's day of 24 hours. The fairly estimated capability of the Halifax Gas-Works is 1,800,000 cubic feet per diem, after making due allowance for retorts in reserve and disabled retorts; *primâ facie*, therefore, the present capital of the undertaking is £225,000, whereas it seems that the amount standing in the books of the corporation is only £230,000, inclusive of land of the value of £20,000 not yet occupied by works. I am, therefore, of opinion that the amount so standing to the debit of capital is by no means excessive or unjustified, and I think it right to observe that I communicated this mode of *primâ facie* estimation to your chairman before I had become acquainted with the special circumstances of your case, and therefore without bias in favour of any result to which it might lead. I have, however, thought it right, in accordance with the intention of your instruction, to make a further valuation, based on actual quantities, which (with the addition of a small per centage for insignificant and unenumerated articles) brings out the sum of £234,939 as the amount of capital fairly represented by your undertaking in land, structures, and plant.

19. Having had my attention called to the ratios which the actual and apparent profits bear to the capital invested, I beg to state that with regard to the former it amounts to £20,233, or very nearly £9 per cent. per annum on the above-mentioned sum of £230,000, and quite 8¼ per cent. per annum on the total amount (£243,182) at which the loan account now stands, but that this actual amount of profit is reduced in your books to an unreal amount of £5459 by the reduction of the following sums:—

Interest on loans	£10,645	16	1
Sinking-fund	1,716	10	5
Depreciation	1,352	16	2
Bad debts	1,159	3	9
	£14,874	6	7

20. With regard to the allowance for depreciation, I may observe that in the case of Halifax it is in truth quite unnecessary, because it has been the practice of the committee not only to repair, but also to restore and renew, and even sometimes improve, the structures and plant from the proceeds of revenue. The concern is, therefore, constantly kept in a going condition, hale and hearty, and always capable of doing the work and rendering the services required of it, and which the outlay of capital intended it to render. Moreover, the sinking-fund (already amounting to £11,767) will of itself do all that is proper towards the gradual reduction of capital which is theoretically thought to be necessary in the interests of a future generation. And with regard to the bad debts, I may remark that these should in my opinion always be taken at the annually ascertained amount at which they will or ought to appear in the uncollected column of the gas-rental. By a good system of personal application to indebted consumers the amount of bad debts can always be kept at less than one-half per centum on gross charges for gas and meter-rents, or, say, on the Halifax Gas-Works below £220 per annum, and this notwithstanding the considerable number of cottage consumers (probably 8000 out of 15,000) from whom separate collections have to be made.

21. The number of public lamps supplied by the Gas Committee is very remarkable, there being a total of 1583, or about one lamp to 55 persons, and I observe that these lamps are supplied at 4d. per 1000 feet below the general price charged to other small consumers. I venture to suggest that this system of charge is not only unfair to the undertaking, but that it is prejudicial in a public point of view inasmuch as it operates to enhance the price of the gas to the small consumer, who is in general to only a slight extent relieved by the diminution of the rate from which the expenses of the public lighting are defrayed. The public lamps are amongst the worst of customers, for each burner has its own separate service-pipe and its own separate leakage, and being in general unmetered, its own separate aptitude for over consumption, and although it is true the amount charged for the whole of the lights is paid for in one sum, and is not subject to the half per cent. loss to which I have adverted (together amounting to little more than one penny per 1000 feet), yet in many other ways this small saving (allowed for on account of 4d. per 1000 feet) is more than counterbalanced by other causes of expense peculiar to public lamps. If this matter be within the scope of my instructions, I shall certainly take the liberty of suggesting that the public lamps be in future charged at the same prices as small private consumers are charged.

22. I have inquired into the amount of the loss by so-called leakage—*i. e.*, the difference between the amount of gas manufactured and registered by the station-meter, and the aggregate of the gas sold and charged for in the meter-rental. The per centage of gas thus unaccounted for is in general a severe test of the good or bad state, and of the good or bad management, of a gas undertaking; and in practice it is found to range from 8 per cent. to 25 per cent.; the average, even in reputedly well-conducted concerns, being 15 per cent. or 16 per cent. In the Halifax Gas-Works the loss, undiminished by any allowances for differences of temperature or otherwise, has not during the last five years averaged 11 per cent.; and this notwithstanding the unusual length of the mains, the unusual proportion of small consumers, and the great number of public lights.

23. The gross profit reckoned upon the quantity of gas actually sold is about 1s. 10d. per 1000 cubic feet, and amounts to something more than one-third of the gross receipts. Viewed under either aspect, this is a very satisfactory result in regard to the prices charged for the gas, and it is, I believe, mainly due to the fact that the committee had some years ago made contracts for coal which enabled them to tide over the recently dear times which have, in so many other places, proved disastrous to the purveyors of gas to the public.

24. The quantity of coke sold, and the improved prices now being obtained for the other residual products (tar and ammonia water) are also satisfactory, and, therefore, need no further comment from me. I think, however, that with a view to future lettings, and even with the (possible) object of hereafter manufacturing valuable secondary products under the statutory powers you now possess, it may be advisable to keep exact accounts of the quantities and qualities of the tar and liquor produced at your works.

25. I have examined the ratio of the growth of the capital account, and find that it is nearly in accordance with the customary compound rate of 7½ per cent. per annum found to obtain in most manufacturing towns. I find, too, that the increase in the consumption of gas has followed nearly the same proportion. If allowance be made for the investment at Salterhebble, and for the large outlay recently incurred in sidings and coal stores, it will be found that the cost of capital per million feet of gas made has of late years sensibly diminished. I am, however, content with the general fact that the increment of the capital account is consistent with general experience.

26. Having now considered all the subjects which have been brought under my attention, I have much pleasure in submitting this report, and in expressing my thanks to the committee and their officers for the unreserved manner in which every necessary information has been placed at my disposal.—I have the honour to be, gentlemen, your most obedient servant, T. HAWKSLEY.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

The Fourteenth Annual Meeting of the North British Association of Gas Managers was held on Friday, July 9, in the Guildhall Corporation Buildings, Dundee—G. R. HISLOP, Esq., F.C.S. (Paisley), the President, occupied the chair.

Mr. WM. MACKENZIE (Dunfermline), the honorary secretary, read the minutes of the last annual meeting, also minutes of committee meetings held during the year, which were approved.

As sanctioned by the last annual meeting, the election of office-bearers for the current year took place by ballot, and Messrs. D. M. Nelson and D. B. Peebles were chosen scrutineers.

NEW MEMBERS.

The following gentlemen were admitted as members of the association—viz.:

ORDINARY.

Bell, Alexander	Gibraltar.
Black, P. A.	Grahamston, Falkirk.
Blair, Peter	East Wemyss and Buckhaven.
Drummond, William	Coatbridge.
Fairweather, William	Barhead.
M'Gilchrist, James	Dumbarton.
Millar, Robert	Innerleithen.
Mitchell, Alexander	Alyth.
Mitchell, Alexander	Dundee.
Monk, Levi	Lanark.
Napier, Andrew	Comrie.
Niven, David Coates	Dunoon.
Scott, Alexander	Markinch.
Smith, Alexander	Aberdeen.
Walker, Henry	Saltcoats.
Young, William	Paisley.

EXTRA-ORDINARY.

Donaldson, Alexander	Edinburgh.
Dunn, W. L.	Glasgow.
Watson, John	Fifeshire.
Wood, William	Glasgow.

The PRESIDENT then delivered the following

INAUGURAL ADDRESS.

Gentlemen, I am aware that the inaugural address of the president of such an association as this is generally expected to assume the character of a comprehensive, critical, and clever review of all the inventions and events of the past year; but, happily for me, the unprecedented amount of business to be overtaken to-day, and that, too, within a very limited space of time, will tend to modify your expectation, and be an ample justification of brevity on my part.

Since it is my privilege to occupy the presidential chair, and my duty to address you, I must first of all acknowledge, with profound gratitude and thanks, the distinguished honour you have conferred upon me in having, for the second time within the last six years, placed me in this position.

I am happy to be able to congratulate you upon a largely increased membership, as well as prosperity, since I last occupied this chair in 1869, and to-day it is my happy lot to announce to you that not one, so far as I am aware, of our number has been removed by death during the past year.

As may be expected, a few changes of location have taken place, which, I trust, may prove an advantage to those who have made them.

The continued prosperity and success of this association is, in great measure, due to the high ability and position of those gentlemen who succeeded or have preceded me, and I beg gratefully to acknowledge the important services which they have rendered in this capacity. Following these gentlemen, I am the more impressed with the responsibilities of my position. If, however, I should fall short of the high standard of perfection which your sanguine imaginations may have depicted for you, I hope you will attribute it to lack of time at my disposal, and not to lack of interest in the objects and aims of this association. I quite realize, but cannot over-estimate, the importance of such an institution of associated scientific men as this. We are here to-day, gentlemen, not on our own account alone, but in the interest of thousands and tens of thousands of our fellow-men. Our aims and purposes are identified with *their* domestic economy, comfort, and happiness. We are here to-day, as arbiters in their interest, to discuss and determine the value of all and every means which may be introduced to our notice for the more economical production and supply of the proverbial essentiality of life—"illuminating gas;" and I need scarcely say that it is a matter of profound solicitude that a still more concentrated and consolidated interest in the prosperity of this association on the part of its members may render it a power more and more recognized amongst the united or associated bodies of scientific men. I cannot but recognize a power in every member of such an association, not only in our united capacity, but individually, and in the circle in which each one moves. That power may be largely in a latent condition; but I am satisfied that were it more fully called forth, directed, and applied, it would confer permanent benefit upon the communities here represented. The gas manager or gas engineer of every town is expected to stand high, and should stand high, in the list of scientific and intelligent men, and assist in directing the current of scientific progress in his day.

During the last 25 or 30 years gas lighting has rapidly developed itself into a universal application, and has become a *sine quâ non* of success and comfort in the factories of the world and the homes of the people, and which has called forth, and now still calls forth, talent, ingenuity, and skill commensurate to the requirements of the age—ability to construct with familiarity and despatch, works which, for magnitude and design, are quite a marvel of our time. How different, therefore, has this extraordinary development, together with a more enlightened knowledge of the chemistry of gas lighting, rendered the requirements of the present day, as compared with those of even a quarter of a century ago? I venture to say that the qualification of a gas engineer of the present time are the most varied and comprehensive that any department of human industry can demand. He must be a scholar, a mathematician, a mechanician, an engineer, chemist, man of science, a philosopher, arbiter, referee, a unique bundle of self-reliance and inherent skill, an epitome of erudition—able to don the cloak of the lawyer or councillor, act the gentleman, and please everybody, and especially the people of his own town. To all to whom this description does not apply, I hope the inductive current of their natural aspirations will bring them to that ideal of perfection.

Mr. Croll, in his communication to the JOURNAL OF GAS LIGHTING some time ago, very properly indicated the position which every gas manager should occupy in his respective town, which I endorse *ex animo*. To that gentleman we are entitled to render the highest respect for the aid he has contributed in advancing the science of gas lighting generally, and for his having instituted a series of examinations, under the London Society of Arts, in those branches of education which are so essential to the business of gas engineer, and whereby, after certain preliminary examinations, the student is afforded the opportunity of proving his practical acquaintance with the principles of the science of gas lighting in its varied details, by an examination paper, and proficiency may be rewarded with a medal. I hope that the rising generation of gas managers will largely take advantage of the facilities thus afforded.

In referring to matters of practical detail in the manufacture of gas, I should first of all observe that the peaceful reign of labour laws within the walls of every gas establishment is a matter of no little importance, alike in the interest of employer and employed, and how best to promote that good understanding and mutual relationship, so essential to economical management and success, must be a matter of constant solicitude on the part of all directors and managers; but I have no hesitation in saying that the most successfully conducted works are those wherein a conciliatory policy is adopted. When the economic difference of services rendered carelessly, and those of a hearty and vigorous character, is considered, instead of a few coppers per day extra being a loss to a company, it is unquestionable gain; and were such a principle acted upon, the difficulties and troubles of management would be greatly reduced. There is no hiding of the fact, however, that the incessant round of seven days labour, which still largely prevails in our gas-works, must be a fruitful source of dissatisfaction and discontent—and very naturally so—and I should be chargeable with neglect of duty did I not lift up my voice against this Sunday whole-day labour, as being a breach of heaven's law, and a disregard of the demands of nature for which divine wisdom and goodness has provided in a blessed day of rest. I feel I cannot too strongly press home upon your attention the duty of cessation from labour during a portion, at least, of every Sabbath, that the exhausted physical powers of a large and important body of men may be renewed and fitted for the better performance of the other six days labour, which, I am bound to say, will always be the case; and here we have some compensation for certain loss entailed by suspension of Sunday labour.

It is just 10 years last Sabbath since I introduced Sunday labour suspension in the works under my care. Retaining sufficient men only to give the necessary attention to the furnaces, I have been, and still am, enabled to stop the works for 10 hours during a considerable portion of each year. For three months in mid-winter, however, with a rather variable consumption of gas, and a limited storeage of about 60 per cent. of daily sale, I do not generally cease labour more than six hours, but in every case, however, when the men work a portion of the day, they obtain full pay for it. The arrangement works well, and with much satisfaction to myself and appreciation on the part of the men.

Much has been done in this direction, as you are already aware, by some or the London and provincial gas companies—notably, the London and South Metropolitan; indeed, in the able engineers of these works (Mr. Morton and Mr. Livesey) we have the leaders of this good cause. I can now only express the hope that Sabbath-observing Scotland will not be behind in this matter, but that she will take a place worthy of her name and honour, and in this give an example which the world may imitate.

Coal Market and Financial Difficulties.

Gentlemen, we have to congratulate ourselves and our gas consumers that we are again emerging from another critical era in the history of gas lighting, in which both companies, corporations, and consumers have materially suffered. Many gas companies and corporations have, on account of the high price of coals during the past two years, had to cope with grave difficulties in complying with local Acts or the public mind on the one hand, and their shareholders or annuitants on the other. Those who, with regard to price of gas, were fortunate enough to be bound by moral obligation only, had simply to raise the price and demand payment; but in several cases temporary shelter had to be taken under the wings of Parliament, which invested the Board of Trade with certain powers to grant relief, and which, in any case, was obtained only after considerable trouble and solicitude, and after the why and the wherefore had been most clearly established. It is now to be hoped, however, that, by a better understanding and a more settled relationship between capital and labour, the recurrence of such another crisis may be averted. It is just questionable, however, whether, without legislative enactments, we are entitled to look for future exemption from such trials. I apprehend that some well-balanced and equitable adjustment of the rights and interests of capital and labour, including some fixed, although somewhat liberal, law of compensation to the capitalist or employer of labour, when he disposes of his produce to light and warm the houses of his fellow-man, is necessary. No doubt this would be interfering with private enterprise and free trade, and which, unquestionably, is the point of danger and difficulty; but the interests of not only gas companies, but the general public, are so closely associated with the coal producer and his men, that unless the conduct of the few be regulated, in part at least, to harmonize with and conduce to the social comfort and happiness of the many, we can have no permanent improvement upon the present unfortunate condition of things. Meanwhile, however, let us be thankful for the reduction in price of coals which has taken place. In the winter of 1873 the prices ranged about 100 per cent. above former prices for all classes; now, while the first class hold firm at from 25 to 30 per cent. higher, yet the third class may be said to be about as low as formerly. A permanently enhanced price in the case of first-class coals is to be feared. Naturally, this class is largely exported at good prices, and sought after also by English gas companies, thus giving rise to scarcity and high value.

It is beyond all doubt that Scottish gas companies will find relief only when a lowered standard of power, say from 20 to 22 candles, instead of from 26 to 30 candles, has been proposed to, and accepted by, the gas-consuming public; and I have no doubt that, with properly adapted means of combustion, it would prove to the advantage and satisfaction of all. Proportionately, such gas could be supplied very much cheaper, inasmuch as it would enable us to draw our supplies more largely from the abundant third-class cannel, and also enable us to utilize more extensively the many excellent splint coals with which the country abounds. The force of circumstances will, undoubtedly, ere long bring such a change about.

In these days of high-priced coals, it is matter of supreme importance, the judicious and careful selection of such as will afford the most economical working results; and this is rendered all the more difficult, on account of the great variety of coals now found in the market, and with gas-yielding properties ranging from 7500 to 15,000 cubic feet per ton. I need scarcely say that, in order to secure this, all that a coal contains must be carefully estimated, and full and fair allowance made for diminished production per ton, below a certain standard volume, by setting so much against the coal per ton on account of additional cost in wages, tear, wear, &c. All this being carefully done, you may produce 8000 cubic feet of gas per ton only, if you please; and I shall not be entitled to question the economy of your working until I have ascertained for myself the nature and price of your coal in relation to others in the market; as, in point of fact, 8000 cubic feet per ton of coal, in the case of one, may be a result quite as economical and satisfactory as that of another who is in the apparently enviable position of showing a working result of 10,000 or 11,000 feet per ton. I advert to this, as it is a matter daily gaining place in the public mind, that a high production of gas per ton of coal and superior management are synonymous terms! The stand-point should be on the cost per 1000 cubic feet of gas of a given power, carefully determined, delivered into the gasholders, or returned at the consumers meters, the circumstances of distance from the coal-fields, &c., being taken into account. That I hold to be the principle of test, and not the produce, *per se*, of gas per ton of coal. Of course, I refer in particular to gas manufacture in Scotland, in so far as low produce is concerned. In England, where the coals employed show a comparatively small range of productive power, the produce per ton may be taken as a more direct indication of good or bad management.

New Inventions and Improvements.

However much may be said in reference to inventions and improvements of the different descriptions of apparatus employed in the production and distribution of gas, the limited time at our disposal will not permit more from me than a passing notice of a very few; and, with regard to the economic distillation of coal, we have first of all two systems, in reference to which your committee regret that the prize so kindly offered by a member of this association for a paper, setting forth the relative advantages, or otherwise, which may belong to these systems, has not been responded to. I refer to the process patented by Mr. Malam, of Dumfries, and that of Messrs. Young, Scott, and Stephen, of Musselburgh. I am glad to observe, however, that the former process will be brought before us to-day, although not in a form claiming to be under any of the conditions upon which the prize referred to was offered. Unquestionably, the sooner the merits or demerits of any new invention are proved and set at rest the better, as in very many cases it would save considerable expense, as well as suspence both to the patentee himself, and to all interested in scientific progress. In this consideration, therefore, I think it would be quite within the province of this association to appoint a committee of investigation, which may either consist of two or three gentlemen of recognized ability, ordinary, extra-ordinary, or honorary members of this association, or the committee as a body acting for the time being, who in conjunction with the patentee, and with his own apparatus (which should be upon a practical scale), could thoroughly investigate, prove, and report upon such inventions to the first or next succeeding annual meeting. A sum could be voted to cover the expenses incurred during the investigation in each case, after the report has been presented, together with a note of the said expenses, or a maximum amount in the name of expenses could previously be fixed if need be. I believe, gentlemen, that were such a means as this taken to determine the value of any new processes brought under our notice for discussion at these meetings, from time to time, either in the form of a paper, or request by the patentee to investigate, it would prove highly satisfactory to all concerned, and I recommend it for your consideration. Of course, as there might be many things brought forward of really little value, it would be for the members of the association to decide which, if any, possessed sufficient merit to justify an expenditure of time and money upon them. In the meantime, however, we must leave these inventions to the old "time and patience" test principle; both patents have already been so fully described in the pages of the JOURNAL OF GAS LIGHTING, that I think it unnecessary that I should further advert to them.

Letters patent have recently been obtained by Henry Aitken, Esq., of Falkirk, for improvements in the manufacture of gas, and described in the JOURNAL OF GAS LIGHTING for the 13th of April last. This invention has for its object "the enhancement of the illuminating power of the gas obtained in the destructive distillation of coal and other substances;" and this the patentee claims to effect by "the treatment of the crude gases, whereby they are enabled to retain, or be saturated with, the volatile hydrocarbon vapours and rich gases, which by the ordinary methods of gas making are absorbed by, or carried off in, the tar and aqueous vapours." The principle seems to be the maintaining in contact for a certain period of time, and at particular stages of the process, the gases and tar in a somewhat highly-heated condition, but not exceeding the boiling point of water. Four modes are referred to by which this may be effected, but time will not permit my giving these in detail.

A great deal has been said and done of late years in the matter of dip-pipes—some advocating the use, and many others the disuse, of the fixed liquid seal. To effect the latter object we have several inventions of more or less merit, and to-day we are to be favoured with the results of further investigations into this subject, and it is to be hoped that the discussion elicited may result in a settled conviction as to which should be the thing for the future.

In the matter of mechanical stoking there are several patentees, candidates for public favour. Amongst these is Mr. Warren, of Crewe, who read a paper at the British Association meeting lately, which appeared last month in the JOURNAL OF GAS LIGHTING. A special feature in Mr. Warren's arrangement is that many machines may be worked by means of one stationary engine and an endless rope passing round the retort-house. As you are already acquainted with all others, it is unnecessary that I dwell upon this subject. I think it due, however, to my predecessor in the chair, Mr. Foulis, of Glasgow, to add that I have it upon good authority that his hydraulic stoking apparatus is working admirably, and affording every satisfaction, in the gas-works, Rochdale Road, Manchester, where it has been introduced and in operation for some time.

The steam-jet principle of gas exhaustion, invented by Messrs. Cleland and Körting, gives some promise of success. The idea, which is remarkably simple, seems to have been taken from the Gifford injector, and is well adapted for the purpose for which it is set forth, in relation particularly to the manufacture of gas of 20 candles and under. As, while the effects of high temperature and watery vapour do not operate prejudicially upon such gases, it remains to be determined what action these would have upon gases of much higher power.

The position recommended by the patentees for this exhauster being after the ordinary condensers and scrubbers, and before the purifiers, it is natural to suppose that, in order to avoid the measurement of the gas at a high temperature, the heat imparted to the gas by the steam must be counteracted; and which, of course, can be done only by additional condensing apparatus, placed immediately after the exhauster, or (possibly, in some cases, with advantage) after the purifiers, as recommended, which is an element of some importance in determinating its economic relation to the means now employed. The steam-jet already finds many useful applications, and it is just possible that it may play an important part in the process of gas production in the future.

I should here call your special attention to a paper read by Mr. Livesey, before the members of the British Association of Gas Managers, lately, and fully reported in the JOURNAL OF GAS LIGHTING of the 22nd ult., wherein that gentleman gives the results of his experience in working F. C. Hills's liquor process of purification, which are certainly very astonishing. Owing to the purification in Scotland being mainly effected by lime, and the necessary removal of the CO_2, which forms quite five-sevenths of the gross impurity, the liquor process referred to would be especially valuable as a means of very considerable saving. I therefore recommend the paper for your careful perusal.

The economical construction of tanks, consistent with perfect tightness, is ever a matter of profound solicitude on the part of gas engineers; and last year a very valuable and interesting paper was read, at the meeting of the British Association of Gas Managers, by Mr. Douglas, of Portsea, on the construction of concrete tanks, and to-day we are to be favoured with a paper on the same subject. It is most opportune, and I have no doubt we shall benefit by the information it conveys, as I believe this principle of construction will find general adoption in the future.

Leaving tanks, we naturally come to governors. Of these there are already several—the wheel, chain, and weight; the quadrant, chain, and weight; the float governor regulated by weights, and the float regulated by water, and these variously framed, guided, and protected; others enclosed by a hood over the mouth of tank, with small centre opening for chain or rod passing through, each having its advocates.

We are all at one, however, as to the importance of such instruments fulfilling the one grand condition of affording a perfect control over the pressure maintained upon our distributory systems, as no small share of the success of a gas company is due to the offices of this valuable instrument, and, as a consequence, any improvement made upon it must be hailed with satisfaction; and I have to-day to bring under your notice an improvement in this direction of a very novel, interesting, and valuable character, which I was lately invited to inspect in the premises of Mr. D. Bruce Peebles, Edinburgh, the inventor, and I hope you will pardon me if, while referring in general terms to the principles and action of this governor, I do not enter into a mechanical descrip-

tion of it, for the reason that I question my authority to do so while the instrument is in process of being perfected and secured by letters patent.

In the first place, the working parts of this governor are entirely enclosed in an outside casing, rendering such accidents from escape of gas as occurred at Nine Elms, London, some years ago, and at Accrington lately, impossible.

Secondly, the action of this instrument is very delicate, and can be controlled at a distance; so that, should the governor-room and manager's house be placed considerably apart, he need not go to the governor-room to effect any desired alteration of pressure, but may simply alter it throughout the entire pressure range of the gasholder without rising from his seat, should he wish to do so.

Thirdly, it can be used as a district governor, and a district day and night pressure can be established in any high locality.

By reducing the pressure at the works, a low day pressure can be put on in a high district; and, besides, a maximum night pressure can be established which will come into action immediately the pressure is put on at the works. The advantage of this new arrangement is, that the night pressure may be altered without in any way altering or disturbing the prearranged day pressure, and *vice versâ*.

While there are already district governors which partly fulfil these conditions, I believe none have hitherto been made by which a separate maximum and minimum pressure can be established, each independent of the other, and both controlled by the station governor at the works.

I have little doubt, therefore, that when the patentee is in a position to illustrate and explain to you the mechanical arrangement of this instrument, together with the objects which, with exquisite delicacy, it accomplishes, you cannot fail to admire the contrivance. For station and district purposes it is sure to meet with favour.

The distribution department of every gas establishment, being second only in importance to the distillatory in the retort-house, every means by which the volume of the unaccounted-for gas can be lessened must be hailed with positive satisfaction; and however much may be attributed to defective main and service pipes, I fear that in many cases it is greatly due to defective measurement of meters; therefore, too much importance cannot be placed upon a proper systematic and periodic examination of these in the workshop. I need only refer you to the very excellent and practical paper upon this subject read before the English Association in Leeds lately, by Mr. Douglas, and which appeared last week in the JOURNAL. With that gentleman's views I most thoroughly agree—indeed, we each seem to have been following a plan almost exactly alike—not only in the fixed periodic system, but in the use of a fixed series of colours (one for each year), as a means of identification in order to periodic examination and repair.

As materially affecting the proper action and durability of gas meters, the nature of the water with which wet meters are filled is important. Where the water is hard, it would be more profitable during watering surveys, where wet meters are chiefly employed, to engage lads at 6s. or 7s. per week to carry in a can clean soft or rain water, to be supplied by the consumers from their rain water cisterns. As the survey goes on, such lads are soon trained to water the meters under the eye of the inspector, who is enabled to go through his work with clean book and clean hands, and, I am bound to say, much more expeditiously, and at the same time with certain satisfaction to the manager, there being no inducement to pass on with the remark, "Can't need water this time." In any case, I strongly recommend this plan for small works, where the manager or his assistant has to be out for two or three weeks periodically to survey the meters.

While recognizing in the ordinary wet meter a very perfect measuring instrument, when the conditions of watering are fulfilled, all devoted advocates of the wet meter system must hail with real satisfaction an improvement lately brought under our notice, whereby measurement is rendered practically correct under very varying conditions of water level. I refer to the Warner and Cowan new patent wet meter, with which you are already quite familiar. The object of this invention is to secure the seller against loss through negligence or irregularity in the watering arrangements, but certainly not to supersede ordinary systematic watering. I need furnish no further proof of the value of this invention than that of submitting to you the following table of testings of the different sized meters:—

Size of Meter.	Gas per Hour at 5-10ths Pressure.	Indication at High Water Level.	Quantity of Water Extracted.	Indication at Low Water Level.
2 lights.	12 cubic feet.	1 per cent. fast.	5½ gills off.	1 per cent. fast.
3 ,,	18 ,,	1 ,, ,,	6½ ,,	1 ,, ,,
5 ,,	30 ,,	1 ,, ,,	13 ,,	2 ,, ,,
10 ,,	60 ,,	2 ,, ,,	16 ,,	1½ ,, ,,
20 ,,	130 ,,	Net.	36 ,,	Net.
30 ,,	190 ,,	Net.	58 ,,	1 per cent. fast.
50 ,,	300 ,,	1¼ per cent. fast.	2¼ gallons off.	2 ,, ,,
60 ,,	360 ,,	...	...	...
80 ,,	480 ,,	...	...	...
100 ,,	600 ,,	Net.	4 gallons off.	½ per cent. slow.
150 ,,	900 ,,	1 per cent. fast.	6¾ ,,	¾ ,, fast.

It must be a conviction in the minds of all who have given any attention to the subject, that the present method of testing meters for accuracy of measurement is at once loose and unsatisfactory, with special reference to dry meters, inasmuch as these tests are conducted under uniform conditions of pressure and volume, the latter varying only with the size of the meter, and the former constant, or at 5-10ths of an inch; while several tests for measuring capacity are necessary, including two extremes and a mean of pressure and volume; and while these are made by placing a disc upon the upright spindle, a last test should be made to determine the accuracy of the indicating wheels and pinions.

In speaking of meters, I am just upon the threshold of another subject which I cannot pass over unnoticed. I refer to the supervision of the gas to the point of combustion by the engineer or manager. I do not mean the supply and fixing of internal pipes and fittings, as that may be a subject for diversity of opinion; but I mean what all must be agreed on—namely, the judicious and intelligent supervision, on the part of the manager, of the gas to the point of combustion—a matter alike in the interest of buyer and seller. I am certain that were the Scottish gas consuming public in particular, who have no specified or standard burner, and with a varying quality in different towns, guided in the matter of economical combustion by the use of proper means, very considerable saving and satisfaction would be the result. And besides this it would certainly tend to foster a more friendly relationship between company and consumer. On this, however, I dare not longer dwell, as I may encroach upon the subject of a paper to be brought before us to-day.

Gas Supply Legislation.

No little excitement was recently created, and uneasiness felt by gas companies on the introduction by Sir Windham Anstruther, Mr. Grieves, and Mr. Holms, of the Burghs and Populous Places (Scotland) Gas Supply (No. 2) Bill, to enable local authorities to erect gas-works for the supply of their own burghs with gas, and to levy a rate to defray the expenses. This bill in its first aspects seemed, intentionally or unintentionally, to ignore the rights and interests of existing gas companies, inasmuch as it contained no provision for the due and proper recognition, by way of purchase, of the properties of such, and who may have invested their means in the undertakings for the public good, and at a time, perhaps, when the supply of gas by local authorities was never entertained. All this naturally excited just alarm, and in order to rectify this and other objectionable features of the bill, saving clauses have been introduced through the energetic action of the representatives of certain gas companies, and the principle of valuation in the transfer of existing works to the local authorities under this bill will be by arbitration. In other respects also this bill, as now read the second time, and amended by committee, may be recognized as a somewhat fair and equitable one.*

Papers to be Read, &c.

The subjects to be brought before us to-day, as announced to you by circular placed in your hands by the secretary 14 days ago, are all of a highly interesting character, and are as follows, viz.:—

1. "A New Dip-Pipe and Bye-Pass for Hydraulic Main," by Mr. Joseph Gibb, Gas-Works, Armagh.
2. "Appliances for Removing or Lessening the Dip-Pipe Seal in Hydraulic Mains," by Mr. George Boyd, Gas-Works, Alloa.
3. "An Alarm Pressure-Gauge," by Mr. P. A. Black, Joint-Stock Gas-Works, Falkirk.
4. "Malam's Process of Gas-Making," by Mr. Alexander Smith, Gas-Works, Aberdeen.
5. "The Relations which Exist between the Durability and Bromine Tests and the Illuminating Power of Gas as expressed in Standard Candles," by Mr. A. Macpherson, Gas-Works, Kirkcaldy.
6. "A Word to Gas Managers, with Special Reference to the Necessity for Improvement in the Use of Gas," by Mr. B. M. M'Crae, Gas-Works, Dundee.
7. "The Construction of Concrete Tanks," by Mr. A. Macpherson, Gas-Works, Kirkcaldy.

In addition to the foregoing, I must refer in a word to certain models and drawings now before us.

We have illustrated, by means of full-size drawings and models, a very simple and valuable "hydraulic dip" arrangement, invented by Mr. J. G. Hawkins, of the Neepsend station of the Sheffield Gas Company, who has been kind enough not only to forward these for your inspection, but to be here to-day in person to explain them, and afford us general information on the subject.

We have also a beautiful model of a new governor, invented and designed by Mr. Wm. Key, of Accrington, which is worthy of inspection. Its object is to prevent such unfortunate accidents as occurred at the Accrington works lately; but as Mr. Key is also here to-day, I hope, before we conclude, to be able to call upon these gentlemen to explain the nature of their inventions.

In the afternoon we are again to be favoured with a lecture by our esteemed friend, Dr. Macadam, of Edinburgh, on "Chemistry in its Relation to the Manufacture of Gas."

In conclusion, gentlemen, I hope the entire proceedings of this day may prove at once agreeable and profitable to all, and that, as becometh the sons of light, all discussions and criticisms will be conducted in a conciliatory and friendly spirit, and I trust to your kind sympathy and support while I endeavour to conduct this meeting to a successful termination.

Mr. B. M. M'CRAE (Dundee): There it a duty incumbent upon us which we cannot ignore, and that is to express our heartfelt gratitude and thanks to the president for the admirable, well-prepared, and practical address to which we have had the pleasure of listening. I, therefore, move a hearty vote of thanks to the president for his address, which is of high quality, and the careful perusal of which afterwards by the members of this association will be of no little advantage.

The PRESIDENT acknowledged the compliment.

ELECTION OF OFFICE-BEARERS.

The scrutineers reported that, upon an examination of the voting papers, it was found that the following had been elected office-bearers for the current year:—

President.—Mr. Samuel Stewart, Greenock.
Vice-Presidents.—Mr. A. Macpherson, Kirkcaldy; Mr. Robert Renton, Montrose.
Committee.—Mr. John Reid, Edinburgh; Mr. Thomas Whimster, Perth; Mr. B. M. M'Crae, Dundee; Mr. Andrew Scott, Musselburgh; Mr. Peter Watson, Stirling; Mr. George T. Myers, Broughty Ferry.
Honorary Secretary and Treasurer.—Mr. William Mackenzie, Dunfermline.
Auditor.—Mr. William Fraser, Inverkeithing.

THE ACCOUNTS.

Mr. FRASER (Inverkeithing), the auditor, submitted a statement of the accounts, which was approved of.

PAPERS READ.

The reading of the papers, a list of which is given in the president's inaugural address, was then proceeded with. These, with the discussions thereon, will appear in subsequent numbers of the JOURNAL.

PLACE OF MEETING IN 1876.

It was resolved that the association should meet in Edinburgh in 1876; and it was agreed that the president and president elect, with the secretary, should prepare the report of the proceedings of the meeting of 1875.

EXPECTED LECTURE BY DR. STEVENSON MACADAM.

Mr. MACKENZIE, the secretary, said: I have received a telegram from Dr. S. Macadam, who intended to deliver a lecture to us this afternoon, in which he says: "Deeply regret that I am closely detained here to-day on legal employment, and cannot, therefore, be personally with you."

The PRESIDENT: We are all at one in our regret at the non-appearance of our friend, Dr. Macadam. We always receive pleasure and instruction from the lectures he is kind enough to deliver to us, and I hope we shall have the benefit of what he intended to say to us to-day in a printed form.

VOTES OF THANKS.

Mr. M'CRAE: Before our proceedings are closed there are several votes of thanks which must be proposed in gratification of our own desires and as matters of duty. First, I have to propose a vote of thanks to our president, not only for the manner in which he has conducted the affairs of the association during the past year, but for the excellent and impartial way in which he has performed his duty this day. I am sure we are all pleased with the energy and activity he has displayed at this meeting, the first held in Dundee, and which, I am glad to say, has been so successful.

The PRESIDENT: I am very much obliged to you for this expression of your appreciation of my humble services. If I have fallen short in anything, I am exceedingly sorry; but I have done my best to meet your wishes, and to conduct the proceedings of the day in a worthy manner.

Mr. M'GILCHRIST: I beg to propose a hearty vote of thanks to the various gentlemen who have read papers, but who have not been accorded a vote of thanks before this time.

Mr. KEY: I beg to propose a hearty vote of thanks to Mr. MACKENZIE, the secretary, for the very able manner in which he has conducted the business during the past year.

The PRESIDENT: As president, I have had some connexion with Mr. Mackenzie in the conduct of the business of the association, and am in a position to give some information regarding the valuable services he renders. I think the vote of thanks particularly well merited, for we are very greatly indebted to his energetic action for the successful meetings we have annually. It must entail a very considerable amount of time and attention on his part to complete all

* This bill has since been withdrawn.

arrangements connected with the association, and therefore I cordially agree with what has been already said, and beg to second the motion.

Mr. MACKENZIE: For the unanimous vote you have passed I can only return you my most sincere thanks. I have hinted during the past year that it was about time I should rest from the duty I have discharged so long, and I am sorry no one has been proposed in my place. I accept the unanimous vote of the members, and will do my best to conduct the affairs of the secretaryship in a satisfactory manner.

Mr. BROWN (Arbroath): I think we are entitled to give a vote of thanks to the committee for the arrangements they made for this meeting.

Mr. KEY: I must say that the arrangements made this year are superior to those of any former year. The issuing of the voting schedules is a great improvement, and the drawings which have been exhibited in illustration of papers have been admirably executed. Everything has been so successfully carried out that I am sure all of us have experienced real pleasure in attending this meeting.

Mr. FRASER: I propose a vote of thanks to the provost and magistrates of Dundee, for kindly allowing us the use of this hall. Most of you know that they are large gas proprietors, and take a deep interest in all questions affecting the manufacture, and I am sure they are glad at having the opportunity of affording accommodation to the members of this association.

A vote of thanks to the auditor, Mr. Fraser, concluded the proceedings.

ANNUAL DINNER.

Later in the afternoon the members of the association dined in the Royal Hotel. Mr. HISLOP presided, and a very pleasant evening was spent.

(To be continued.)

METROPOLIS WATER SUPPLY.

The Registrar-General publishes the following returns of the average daily quantity of water supplied by the London water companies during the month of June, 1875. According to their returns, 127,381,916 gallons, or 578,754 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily; or 246 gallons (111·8 decalitres), rather more than a *ton* by weight, to each house, and 34·6 gallons (15·7 decalitres) to each person, against 34·9 gallons during June, 1874. According to returns of the London water companies made to the select committee on East London Water Bills (session 1867), it is estimated that, during the year 1866, about 82 per cent. of the total supply of water for all purposes was for domestic use. Applying this proportion to the total quantity supplied daily in the month of June, 1875, it may be estimated that about 104,453,171 gallons were used for domestic purposes, or about 28·4 gallons per day for each inhabitant, against 28·6 in the corresponding month of last year. This proportion varies from month to month, but the Registrar-General has no means of giving a more reliable estimate.

COMPANIES.	Number of Houses, &c., supplied in June, 1874.	June, 1875.	Aver. Daily Supply of Water in Gallons* during June, 1874.	June, 1875.
Total supply	507,571	518,127	125,629,086	127,381,916
From Thames	237,198	243,652	64,473,099	65,403,955
,, Lea and other Sources	270,373	274,475	61,155,987	61,977,961
THAMES.				
Chelsea	28,467	28,555	8,703,000	8,356,200
West Middlesex	45,991	46,899	10,711,795	10,732,438
Southwark and Vauxhall	76,679	80,102	18,970,500	19,263,000
Grand Junction	35,144	35,709	12,351,404	12,524,217
Lambeth	50,917	52,387	13,736,400	14,528,100
LEA AND OTHER SOURCES.				
New River	122,134	123,280	29,379,000	29,378,000
East London	105,562	107,294	24,541,880	24,964,675
Kent	42,677	43,901	7,235,107	7,635,286

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for June, 1875, as compared with that for the corresponding month of 1874, shows an increase of 10,556 houses, and of 1,752,830 gallons of water supplied daily.

Dr. Frankland reports that the river waters supplied to London during June had regained their usual summer quality, the amount of organic impurity being scarcely half as great as it was during the winter. Although river water is by comparison easily filtered in summer, both the Southwark and Grand Junction Companies delivered during June "slightly turbid water," which contained numerous "moving organisms." The samples drawn from the mains of the other companies were clear. Taking unity to represent the amount of organic impurity in a given volume of the Kent Company's water, the proportional amount in an equal volume of the water supplied by each of the other metropolitan companies was—New River, 1·3; Chelsea, 2·2; West Middlesex, 2·4; Grand Junction, 2·5; Lambeth, 2·9; East London, 2·9; and Southwark, 3·1. The water delivered by the Kent and New River Companies was, therefore, of much greater purity than that supplied by any of the other companies.

PROPOSED ACQUISITION OF THE EDINBURGH AND LEITH GAS-WORKS BY THE EDINBURGH TOWN COUNCIL.—The question of acquiring the works of the Edinburgh and Edinburgh and Leith Gas Companies was formally under consideration by the Town Council of Edinburgh last week. At an ordinary meeting of that body held on July 12, the Lord Provost referred to the motion, of which notice had been given by Mr. Mossman, in favour of promoting a bill in Parliament to regulate the quality and price of gas, and to enable the council to acquire the existing works by agreement. He said he wished the council to decide whether the present was not the time to consider the propriety of approaching the two gas companies of Edinburgh and Leith, with a view to the acquisition of their respective works, and placing them in the hands of the corporation. This must be done sooner or later; indeed, he might say that Edinburgh was the only city in Scotland, of any magnitude, where such was not the case. There were special circumstances at present arising, to which he need not refer, rendering such a proceeding desirable. He might add that he had already had an interview with the chairmen of the respective companies, and found them open to negotiation if fair and reasonable terms were held out. It could not be expected that the council should then arrive at any conclusion one way or the other; but the subject might be remitted to the Lord Provost's committee to open up formal communication with the gas companies, and bring up a report at next meeting of the council, when there would have been sufficient time for members to make up their minds. This suggestion was agreed to; and it was subsequently arranged that Mr. Mossman's motion on the subject should be referred to the same committee. A meeting of the committee was held on Thursday, when the question was fully discussed. The committee, it is understood, were quite at one as to the desirableness of such a step being taken, and they remitted to a sub-committee to enter into communication with the companies in question, with a view to ascertain the terms and conditions on which the proposed ransfer could be made. Already the subject is exciting a great deal of interest tn Edinburgh and Leith and the immediate suburbs.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The reduction of £1 per ton, declared last week by the leading makers of finished iron, has had the effect of bringing out a few orders for branded iron, but the position of the makers of medium qualities, who decline to make any noteworthy concession in prices, is not materially improved. Some good specifications for medium qualities were offered at the ironmasters meeting in Birmingham on Thursday last, on condition that the full reduction be accepted; but no transaction is recorded on those terms. It is evident that buyers are still only purchasing to satisfy their more urgent requirements, and a belief is current that the commoner qualities of iron will soon be obtainable on easier terms. During the week the New British Iron Company, who, it will be remembered, dissented to the resolution of the other makers in the matter of the late reduction, have yielded, and a circular just issued by that firm, places their prices on the same basis as the other producers of branded iron.

Sheets continue in good demand for medium qualities, and prices are tolerably steady; the galvanizers have intimated that they cannot make any alteration in the price of galvanized corrugated sheets, but they announce that B B flat sheets, cold rolled, and close annealed, are down 20s. per ton, and flat annealed 10s. per ton.

Unmarked bars may be had as low as £8 per ton, and common sheets are nominally quoted £11 5s. to £12 per ton, but for all descriptions of unmarked iron prices are very unsettled.

In pig iron the market is steady, and, at the reduction of 10s per ton declared last week, an improved business is being done, though the reduction does not extend to the commoner qualities. Cinder pig is now in abundant supply at 5s. lower, or £2 15s. per ton. The demand for pigs for foundry consumption continues buoyant. At a meeting of blast-furnace proprietors, held in Wolverhampton on Wednesday last, it was resolved to reduce the wages of the operatives by 10 per cent.

The coal trade continues quiet, but prices—excepting as regards the commoner qualities—are moderately steady, the general cry of the coalmasters is for longer working hours, and it is asserted that in many of the thin coal mines of this district the addition of one hour per day would be equivalent to 1s. 6d. per ton on the minerals raised; but it is not thought probable that the colliers can be induced to accept the desired alteration at present.

THE COAL AND IRON TRADES OF LANCASHIRE.

(FROM OUR OWN CORRESPONDENT.)

The coal trade in the Manchester district continues dull, and there is a good deal of pressure for lower prices, the recent small reductions apparently not being at all considered as final by consumers. In this belief they are encouraged by the action of the smaller firms, who are offering at lower rates, and thus helping to pull down prices; but as stocks, although they are gradually increasing, are not yet particularly heavy, the leading proprietors have made no further alteration in their quotations.

In the Wigan and other neighbouring districts trade is exceedingly flat, and so short of orders are colliery proprietors generally, that, to avoid the accumulation of heavy stocks which there is no prospect at present of being required, the pits are closed about four days every fortnight. Prices are very unsteady, and list rates are only nominal.

The shipping trade continues very quiet, with a downward tendency in prices.

In the Manchester district a tolerably steady business has been done in the gas coal trade, and most of the output has now been placed, but in the Wigan district there are many complaints of quietness, and very few contracts are now offering in the market, whilst those that have been placed have, in many cases, been at low prices, running as low as 9s. 6d. per ton for Wigan four-feet screened, and 11s. per ton for the better classes of screened coal at the pit's mouth.

A meeting of representatives of the colliery proprietors and men in the Oldham and Ashton district was held on Friday at the Clarence Hotel, Manchester, as a court of conciliation and arbitration, with regard to the reduction of wages, of which notices have been served in the above districts. A series of propositions were agreed to for reference to the colliers of the two districts for their decision.

The coke trade is not very active, and there are many applications for reductions in prices; but, so far as the local makers are concerned, these have only been conceded in exceptional cases. Durham makes are easier.

There is really no market at present in the iron trade of this district Business continues very dull, with very little demand; prices still receding. No. 3 Middlesbrough foundry iron, delivered in this district, is now quoted at 58s. 9d.; No. 4, 57s. 9d.; and No. 4 forge, 56s. 9d. per ton; but for good orders merchants are disposed to take even a little less than this. In the finished iron trade bars are being offered at £8 7s. 6d.; angles, at £8 10s.; heavy rails, at £7; and light ditto, at £7 1s. per ton, delivered. But there are odd lots offering at less money than this.

The majority of the founders in this district are slack, and have not enough work in hand to keep them going full time. Forge proprietors also have but little to do, and new orders are coming only very slowly.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The announcement of the failure of Messrs. Lambert Brothers and Scott, of London, who were extensively engaged in the coal trade, caused a great deal of excitement in Newcastle on Friday. It was followed with the suspension of an old established and respectable mercantile house on the Quay Side of that town. Messrs. Lambert Brothers and Scott have been doing a very extensive foreign coal coasting trade mostly in steam, and they have been underselling the trade to a large extent it is alleged. Several colliery owners and steamship owners are, it is believed, considerably hit by this failure. The firm are reported to be owing one coal company £30,000. Down to Friday the coal trade was tolerably steady. Shipments were good, and a considerable number of cargoes of coals were loaded for the coast. Shipping rates and prices remained about the same as on the previous week. A very fair Baltic and Mediterranean trade had also been done. Shipping rates to these parts of the world were fully maintained; but the stoppage alluded to created rumours of further embarrassments, and there was very little inclination exhibited on Friday or Saturday to enter upon fresh engagements.

The iron trade of the Cleveland district is no better; manufacturers state that the present rates do not pay. At the same time, merchants seem to be hanging back for lower prices. Under these circumstances, there is a good deal of uncertainty in the iron trade, and it looks as if there would have to be a considerable revision of wages before much activity is manifested again. The chemical trade of the Tyne is likewise dull; prices were somewhat weaker last week, especially for crystals of soda and bleaching powder, and there were very few orders in the market. The timber trade is becoming firmer, but, in other particulars, the general business of the North of England manifests little improvement.

The shareholders of the North Shields and Tynemouth Water Company have held their annual meeting, and have declared a dividend of 5 per cent. This

company is now in possession of an abundant supply of water, and the shareholders showed no disposition to adopt the valuation put upon their works by Messrs. Fenwick and Hedley, who had acted on behalf of the Tynemouth Corporation, and any negotiations for the purchase of the works by the latter may now be considered off. All the towns in the north are extending very much, and this summer most of the gas companies in the district have been laying down fresh pipes to meet the increased requirements of the towns.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

First in order I must this week take up some news items not overtaken in last week's communication, and shall begin with Paisley. The Corporation Gas Committee of that town have unanimously agreed to recommend to the Town Council that the price of gas in the first survey of the present year shall be 5s. per 1000, but that during the other two surveys it shall be 4s. 2d. per 1000 feet.

At the meeting of the Ayr Gas Company, held on Wednesday week, the annual accounts for the past year were submitted, and on the recommendation of the directors a dividend of 6 per cent., free of income-tax, was declared. The income for the year, including £240 for property sold, was £4032 0s. 3½d., and the expenditure amounted to £2700 1s. 6d. It was agreed to reduce the price of gas from 6s. 8d. to 5s. 10s. per 1000 feet, which is the second reduction this year, the price prior to May being 7s. 6d.

The gas accounts of the Kilmarnock Corporation, for the year ending the 14th of June, were presented at the last meeting of the Town Council. The income for the year was £11,685 0s. 10d., of which £9665 8s. 7d. was gas-rental, being a small decrease over last year. The income and profit derived from the chemical works was nearly double that of the preceding year. The profit was £1056 4s. 0½d., which, added to the amount carried over from last year, made £1659 19s. 3½d. as the sum at the credit of the profit and loss account. Out of this £444 10s. will be set aside for the sinking-fund, the balance to the general account for expenses, repairs, and reduction of rates. The committee expect shortly to reduce the price of gas to 5s. per 1000. The illuminating power of the gas for the year was 28·7 candles. The report was agreed to. In submitting the statement, the provost said that in the contracts for coal, &c., for the ensuing year, a saving of £1200, as compared with the previous year, had been effected.

The Brechin Gaslight Company have held their annual meeting, and declared the usual dividend of 10 per cent., with 1 per cent. of bonus. On a division, it was resolved by a large majority that no discount should be allowed to consumers on their accounts for the ensuing year.

A reduction, from 9s. 2d. to 7s. 6d., in the price of gas has been made by the Wick and Pulteneytown Gas Company, and a dividend of 5 per cent. to the shareholders has been declared upon the past year's transactions.

The shareholders of the Tain Gaslight Company have only had a dividend of 4 per cent., and the price of gas is to remain at 13s. 4d. per 1000 feet.

The Mid and East Calder Gas Company have just paid a dividend of 4½ per cent., as against 2½ per cent. for the previous year, and they have reduced the price of gas from 10s. to 9s. 2d. per 1000 cubic feet.

At Leslie, in Fifeshire, a dividend of 7½ per cent. has been declared, and the price of gas has been reduced from 7s. 6d. to 6s. 8d. per 1000 feet.

The Barrhead Gas Company have lately resolved to reduce the price of gas 1s. 3d. per 1000 feet, dating from the middle of May last. They have also agreed to grant free gas for another twelvemonth for the street lamps.

A dividend of 5 per cent. has been declared by the Banff Gaslight Company, and the price of gas has been reduced 5d. per 1000 feet, as from the 10th of May, to all consumers paying their half-yearly accounts on or before the 1st of January and the 1st of July.

At Lockerbie a reduction, from 8s. 4d. to 6s. 8d. per 1000 feet, has been made. At Stow the price has been reduced 10d. per 1000 feet, and a dividend of 5 per cent. has been declared. At Annan the reduction in price is from 6s. 3d. to 5s. 10d., and the dividend 7 per cent.

At Kirkcudbright a dividend of 7½ per cent. has been agreed to, and the price of gas is reduced from 10s. to 8s. 4d. per 1000 feet, the reduction to commence as at the 24th of May last. A dividend of 8s. on each original share, payable on the 1st of August, has been declared at Dunse; and at Berwick the Urban Sanitary Authorities have accepted the tender of the gas-light company to supply gas to the public lamps at 6s. 8d. per 1000 feet.

At the last meeting of the Paisley Water Trustees, Provost Murrey stated that they could easily reduce the domestic rate from 1s. to 10d. When the works were transferred to the council the domestic and public rate combined was 1s. 6d. per pound, now they would only be 11d. During the first ten years there had been an increase of 72 per cent.; from 1866 to 1874, 120 per cent.; and that next year, when the ten years were finished, the increase would be 133 per cent.

The Kirkcaldy and Dysart Water-Works Commissioners have agreed to assess for 1875-76 at 16d. per £1 for domestic, and 2d. per £1 for public water-rates, being the same as last year. Next year the sinking-fund comes into operation, but on account of the steady advance in the value of property it is not believed the assessment will require to be raised.

In their capacity of Water Commissioners the Town Council of Glasgow met on Thursday, and discussed—but without coming to any finding—the proposal at present before the Water Committee for a reduction in the price of water. Several of the commissioners were of opinion that, if it were found practicable, the surplus should rather be applied in reducing the debt of the Water Trust.

The water supply of Dunfermline has during the last two or three months been getting "small by degrees and beautifully less," and a good deal of anxiety is now being felt about securing an abundant supply. Various schemes have been proposed in recent years, but it is now thought that the Water Trust of the town will have to go to the river Devon. This is being strongly pressed upon them.

It is now proposed that Forfar should get a water supply that would suit both for itself and the village of Kirriemuir. A scheme with that object in view has just been reported upon to the Police Commissioners of Forfar. It is calculated that it will cost £17,000, and supply 1 million gallons per day to a population of 20,000.

A few days ago the members of the Edinburgh Water Trust paid a visit to the Moorfoot Hills for the purpose of inspecting the works now in progress for the impounding of water for the supply of Edinburgh and district; and at their last meeting a very interesting report was submitted from the engineers, Messrs. J. and A. Leslie, upon the progress of the works.

There is really nothing of any special importance to mention regarding the Scotch iron and coal trades. Pig iron has generally ranged between 60s. 3d., and 60s. 6d. cash, for warrants since last report, and some of the coalowners are pressing for orders and offering a discount off current rates in order to effect sales. Prices are still tending downwards. Several collieries are busy to supply the demands of the Quebec fleet from the Clyde.

BIRMINGHAM WATER SUPPLY.—Dr. Hill, the medical officer of health for Birmingham, reports that the water supplied to that town during June was "slightly turbid, and stood greatly in need of filtration. It contained numerous moving animal organisms, some visible to the naked eye, and many vegetable growths. There was, however, a reduction in the amount of organic nitrogen."

GLASGOW WATER SUPPLY.—Professor Bischof, of the Andersonian University, Glasgow, reports that the Loch Katrine water supplied to that city during June, although free from previous sewage contamination, contained "rather large particles of suspended matter."

CLEANSING WATER-MAINS.—Mr. E. Dodds, engineer to the Durham Water Company, has introduced a new self-acting instrument, termed a pipe-scraper. The water of many companies deposits oxide of iron on the inner surfaces of the main and distributing pipes, the effect of which is to reduce them greatly in size. The mode of operation is this: the pipe is cut, the scraper is inserted, temporary joints are made, and the water is turned on at the highest pressure, which drives the scraper on at great speed. In the first experiment a distance of 300 yards of pipe was thoroughly cleansed in 2 minutes and 20 seconds.—*Builder*.

CHESTERFIELD WATER-WORKS AND GASLIGHT COMPANY.—The workmen employed by this company had their annual excursion on the 3rd inst., Chatsworth being selected as the place to be visited. After an inspection of the Palace of the Peak and its lovely surroundings, the party sat down to an excellent dinner at the Devonshire Arms. The good things provided for their refreshment having been satisfactorily discussed, the chairman, Mr. C. E. Jones, the manager of the works, proposed the usual loyal toasts, which were duly honoured. Mr. Edmunds, vice-chairman, proposed, in an excellent speech, prosperity to the company, and it was responded to by the chairman, who gave the health of the directors. Mr. Edmunds proposed the health of the chairman, which was supported by Mr. James, the senior *employé*, and drunk with musical honours and a special cheer for Mrs. Jones. Some excellent songs were sung by Messrs. Wyatt, Nicholson, Higginbottom, Sherwin, Jordan, and F. Wagstaffe, and a most enjoyable evening was spent.

PRESTON GAS COMPANY.—The half-yearly meeting was held on the 12th inst. —Mr. Booth in the chair. The half-yearly statement of accounts was read over and passed, after which the customary half-yearly dividend, at the rate of 10 per cent. per annum on stock A, was declared, and of 7 per cent. on stock B. In moving a resolution for the payment of the dividends, the chairman alluded to the financial position of the company, and stated that a few loans had been paid off during the half year. Others had been accepted, but the amount of borrowed money was still a little below the statutory amount. It would be seen from the statement of accounts that the amount expended on works still exceeded the sum called up by £20,000, although there had been a call of £9000 on stock B during the past half year. The shareholders voted the customary subscription of £10 10s. to the infirmary, and the meeting was brought to a close by a vote of thanks to the chairman.

NEW GAS STANDARDS AT THE LINCOLN CATHEDRAL.—On Saturday last the formal presentation to the Dean and Chapter of the gas standards which have been placed one on either side of the altar enclosure, and the cost of which has been defrayed by a private subscription among a number of the attendants at the cathedral services, took place. The standards, which have been manufactured by Messrs. Barkentein and Krall, of Regent Street, London, are between 16 feet and 17 feet in height from base to summit, the bases being 3 feet 4 inches in diameter, each supported by 4 ornamental buttresses, terminating in lion's claws. The buttresses communicate with the centre shaft, which at its thickest is about 6 inches in diameter, by open fret work, and the shaft gradually narrows till it terminates in a cross with 5 lights branching above it. On each standard there are 4 collars or rings of lights, the largest of these collars being 4 feet in diameter; and there are also 12 small branches of 3 lights each. The smallest ring of lights is 2 feet 9 inches in diameter. The circular shafts are ornamented with flat pilasters, and the branches and upright pillars are also tastefully designed. The whole of the work is in burnished brass.—*Builder*.

SOWERBY BRIDGE GAS-WORKS.—The auditor of the local board (to whom the gas-works in this town belong) has made his annual report for the year ending March 31 last. From this report it appears that the gas-rents show an increase of £468 15s. 5d., now amounting to £7498 9s. 7d.; for street-lamps, £363 15s.; meter-rents, £205 5s. 2d.; coke, £1247 12s. 8d.; tar, £567 1s.; lime and sundries, £41 1s. 7d.; while there has been expended in interest, £1626 8s. 7d.; coals, £3824 9s. 6d. (an increase of £743 9s. 2d.); wages, £1389 8s. 6d. (an increase of £91 18s. 2d.); freight, £587 (an increase of £449 10s. 9d.). As under the old contracts there was no freight to pay, this item, for the sake of comparison, should be added to coal. Lime, £156 12s. 6d.; retorts, £196 2s.; rates and taxes, £304 16s. 1d.; and other items of maintenance and incidental expenses, amounting, in the whole, to £8567 17s. 2d., leaving a profit on the manufacture of £1355 7s. 10d., which, considering the large increase in the items above, compares favourably with past years. There has been added to fixed stock for meters £272 14s. 6d., and for extensions, &c., £367 4s. 5d., making the total expended on works, &c., £43,923 5s. 4½d. The usual transfer of £1060 13s. has been made to the sinking-fund, which now amounts to £8750 7s. 3d. There has also been paid out of accumulated profits on drainage account £470; new boiler, £200 19s.; and written off, as bad and doubtful debts, £78 18s. 11d.; leaving a balance to carry forward of £2314 17s. 3½d.

GLASGOW (CORPORATION) GAS SUPPLY.—At the meeting of the Glasgow Corporation, on the 15th inst., the minutes of the Gas Committee were submitted for approval. It appeared from these that, at a meeting of the committee, on the 23rd ult., the manager explained the present state of the leakage, from which it appeared that, at present, it amounts to about 19 per cent. He also submitted the result of tests he has made of about 100 meters, from which it appeared that a large amount of loss arises from meters not registering at all, or not registering the full amount of gas passing through; and on his advice, and with a view to reduce the loss, the sub-committee recommend that he be authorized to employ a few men who shall devote themselves entirely to the examination of meters. Mr. Walls, in moving the adoption of the minutes, said the accounts for the past year had been prepared in draft form. It might be remembered that they commenced the year with a debt of £14,377, which had now been entirely wiped off and replaced by a credit balance of £3800, as at the 1st of June last. There were several other facts, bearing upon their financial position, to which he might allude. On the sale of the Lancefield property a profit of £8500 had been made, which would go to the reduction of the capital account. This year, 6 per cent., or the sum of £8063, had been written off on meters, instead of 1 per cent., or about £1300, last year. When, last year, 1 per cent. was written off, the wisdom of such a proceeding was called in question, and, in deference to that feeling, 6 per cent. had now been written off, being the amount applicable to years previous to the last. On the cartage account alone there had been a saving of £3000, and he hoped to see that account materially reduced in future. As provided by the Act of Parliament, they had transferred £6500 to the credit of the sinking-fund. He was not in a position to say what the committee would recommend with reference to the future, but he was hopeful that the price of gas might be reduced from 5s. 5d. to 5s. per 1000 feet, as from the 1st of June last; and, as every one knew, the rate must be reduced in November next to 4s. 7d., according to Act of Parliament. The minutes were unanimously approved of.

Register of New Patents.

3108.—BRAY, H., Manchester, "*Improvements in the manufacture of gas for illuminating and heating purposes.*" Provisional protection only obtained Dated Sept. 10, 1874.

This invention consists of certain improvements upon patent No. 3490, Oct. 27,

1873, for the manufacture of gas from sewage, or any decomposed animal, vegetable, or fæcal matter.

In treating the matter from water-closets, the excreta and urine with the water used may be reduced to the liquid state, as before. When decomposed animal, vegetable, or fæcal matter are used, they must also be reduced to liquid with urine, sewage, or stagnant water.

In using the materials in the solid state, the retorts are charged in the same manner as in the case of coal; 15 per cent. of hydrocarbon is then injected, and the gas is purified in the same way as that produced from liquids. Retorts, made of cast iron, wrought iron, cooper, brass, fire-clay, or any other material that will stand the heat and pressure, are employed.

In the present improvements the reservoir or tank containing the liquid ready for use is connected by a syphon-pipe to the first retort. Below the syphon and previous to entering the retort there is connected another pipe from a separate tank containing hydrocarbon, of which about 15 per cent. is allowed to mingle with the sewage. The retort or retorts must be got up to a red heat before the injection commences, and must be kept in that state during the injection. The gas so generated can be passed through the remainder of the retorts, thence through an ordinary condenser on to the water purifier, where the pipe should dip. Screwed to the mouth of the dip is a perforated cap, and after passing the gas through an ordinary lime purifier it is stored in gasometers.

The inventor does not confine himself to mingling the hydrocarbon with the sewage previous to injecting it into the retorts, as a separate pipe to any of the retorts will answer the same purpose. The retorts may be filled with fragments of iron, fire-clay, or broken bricks, in order to detain the gas for thorough condensation. By these improvements the invention is simplified, and can be worked more economically than heretofore.

3152.—POCOCK, A. W., Westminster, "*Improvements in compensating wet gas-meters.*" Patent dated Sept. 15, 1874.

This invention relates to improvements in compensating wet gas-meters, whereby the cam upon the index-spindle is dispensed with for actuating the dip-spoon, undue friction avoided in the rotation of the index-spindle, and a greater certainty of action of the whole mechanism obtained than in compensating wet gas-meters at present in use.

Accordingly the index-spindle is cranked just above the worm-wheel, and the dip-spoon is worked through the intermediation of a rod or bar, the outer end of which is gimballed to a link of the dip-spoon lever to enable the crank motion and the to-and-fro motion to be had without imparting a jerk or jump at any part of its movement. In place of the crank an eccentric or disc can be fitted upon the index-spindle to actuate the rod. In the case of using the disc, it is proposed to place it horizontally upon the spindle, and to form a cam surface upon its periphery, in which case the rod would rest upon the disc, and take a to-and-fro movement from the edge face of it.

3174.—KIDD, J., Martin's Lane, London, "*Improvements in gas-producing furnaces.*" Provisional protection only obtained. Dated Sept. 17, 1874.

This invention consists in a method of decomposing and generating gas, suitable for lighting or heating purposes, by means of a new arrangement of furnace and attachments, combined with a closed decomposing chamber, containing incandescent fuel. Heated gas vapour or the products of combustion are forced through this incandescent fuel, by the escaping force of a jet of steam or hydrocarbon vapour, and is changed into a permanent gas. When the gas is required to be burned in the furnace where it is generated, atmospheric air is allowed to mix with the vapour from the forcing jet; but when the gas has not to be burned where generated, no atmospheric air is mixed with the forcing jet of vapour.

3178.—NEWTON, W. E., Chancery Lane, London, "*Improvements in filters for filtering or purifying water and other liquids.*" A communication. Patent dated Sept. 17, 1874.

According to these improvements, the liquid to be filtered is caused to pass by capillary attraction up threads or yarns and drop into a central tubular chamber, and after filtering through charcoal will pass through the bottom of the chamber into the vacant space beneath, from which the filtered and purified liquid can be drawn off through a suitable tap.

3190.—MARCHANT, R. M., Hatton Garden, London, "*Improvements in or connected with steam and other motive power engines, part of the invention being applicable to the manufacture of gas.*" Provisional protection only obtained. Dated Sept. 18, 1874.

This invention consists in the employment of the stage process of pumping, explained in patent No. 1086 of 1870, for the manufacture of gas from oil, with a limited proportion of water, and the conveying of such gas for use as fuel in steam or other engines. Also in so arranging the chimney or chimneys to the boiler or heater of steam or other engines, that they shall deliver the exhausted products of combustion in their still heated state underneath the fire or flame, such products being thus continually circulated through the fire.

3193.—HOLDEN, J., Halifax, "*Improvements in apparatus for lifting, forcing, or pressing by water, air, or other liquid or fluid.*" Patent dated Sept. 18, 1874.

This invention consists in the application of telescopic tubing to the above purposes, and in the fitting of appliances thereon for making the joints water-tight.

3199.—KIDD, J. H., Wrexham, "*Improvements in the mode of and in arrangements and apparatus for manufacturing manure from sewage, nightsoil, and like matters, and in the preparation and application of certain materials for deodorizing sewage, nightsoil, and like matters.*" Patent dated Sept. 19, 1874.

This invention consists in conveying the sewage to settling-tanks, removing the sediment to filter-beds to drain, then to a hopper, in which there are rotary shafts and arms to break it up, and feed it to a cylinder exposed to heat to dry the material which is propelled through the cylinder. The material passes from this to other cylinders until dry. Diluted sulphuric acid is mixed with the material in the first cylinder to fix the ammonia, and render it less volatile. Nightsoil is treated in like manner, except that no settling-tank is required. It further consists in carbonizing coal, shale, or washings, and apply it to deodorize sewage, nightsoil, and like matters.

3200.—PUNSHON, R., Anerley, Surrey, "*Improvements in fuel applicable to heating and lighting purposes.*" Patent dated Sept. 19, 1874.

According to these improvements petroleum is passed through perforated chalk, to which heat is applied. A condenser is employed between the reservoir of petroleum and the chalk, to keep the petroleum in a liquid state as required. For heating purposes, blocks of perforated chalk are used, and for lamps burners made of chalk. A flashing light for signals is produced by turning the supply of petroleum on and off by means of a fixed cock.

3205.—CROSSLEY, F. W., Manchester, "*Improvements in gas motor engines.*" Patent dated Sept. 19, 1874.

This invention relates to gas motor engines of the kind described in patents No. 434 (Feb. 12, 1866), No. 2245 (Aug. 3, 1867), and No. 605 (Feb, 18, 1874).

According to the present improvements, the piston is raised for drawing a charge into the cylinder, and the slide-valve is moved for the admission and the ignition of the charge by cranks on a countershaft, which is intermittently moved by a pawl engaging with a ratchet wheel geared to the main shaft of the engine, when the piston reaches the lower end of its stroke. For regulating the speed, the piston is retarded or obstructed as it approaches the lower end of its stroke, by a projection on its rack-rod bearing on a piece moved towards it by the lever of a governor when the balls expand.

3225.—M'INTYRE, J., Port Glasgow, N.B. "*Improvements in apparatus for purifying sewage waters.*" Patent dated Sept. 21, 1874.

In carrying out this invention, two depositing tanks are constructed side by side in the line of a sewer, and the sewer is connected to each by separate inlet and outlet branch passages fitted with sluices. Each tank is made to extend down a considerable depth below the sewer level, but the outlet from it is made higher than the inlet, and the sewage waters flow in and fill up the tank until they reach this higher discharge level, the water flowing off as it rises above that level, when a sufficient deposit has lodged in one tank, the sluices are changed so as to direct the sewage waters through the other tank, and the deposit in the first tank is removed. The essential features are the arrangements for obtaining the deposition of suspended matters, whilst the sewage waters flow continuously through the apparatus.

3240.—MALAM, W., Forest Hill, Kent, and GRAVES, T., Lavender Hill, Surrey, "*Improvements in apparatus for mixing air with the vapour of liquid hydrocarbons, to be used for lighting and heating, or for any other purpose; also in the treatment of such hydrocarbons with a view to purifying the same, and obtaining a useful product therefrom.*" Patent dated Sept. 22, 1874.

This invention relates partly to a peculiar construction and arrangement of self-acting apparatus for mixing or incorporating atmospheric air with the vapour of liquid hydrocarbons, for heating and illuminating, or for other purposes; also to a mode of heating liquid hydrocarbons, such, for example, as natural petroleum, with a view to the purification of the same, and to the obtainment of a useful product therefrom.

It consists of a closed metallic vessel or holder, in which is mounted a reservoir containing the hydrocarbon liquid. Air is introduced into the upper portion of this reservoir by means of a pump and gear overhead, and, mixing with the vapours evolved from the liquid, descends through a perforated screen of wool, or other suitable material, and through a series of vertical tubes into the lower part of the closed vessel, where it is preserved at a uniform density or pressure by a regulating device, and when required for use passes off through an outlet-pipe to the burners or other appliance.

3243.—PEACOCK, J. C., Finsbury Park Road, and BRADLEY, C. W., Circus Place, London, "*Improvements in the manufacture of illuminating and heating gas, and distributing thereof for use by means of apparatus adapted for said purposes.*" Patent dated Sept. 22, 1874.

This invention mainly consists in manufacturing, as described, an elastic tube, which is called the generator or generating tube which is made of wire, arranged in a spiral or other form, and covered with a fibrous material, such as cotton, flax, wool, or such like substances, either woven or otherwise. This tube is placed in a spiral or other form in a chamber made of iron, tin, copper, or other suitable material, of any shape, leaving the ends projecting from the inlet and outlet; but leaving sufficient room in the middle of the vessel to allow of a reservoir being placed there, for the purpose of supplying the above-named generator or generating tube with any suitable highly volatile oil or spirit, in such quantity as may be required for replacing the spirit evaporated by means of the generator. When it is not to have the spirit in a liquid state, the spirit holder and generator are combined into a porous block, which holds the spirit by capillary attraction. This apparatus is connected with suitable burners, and upon ignition, then as combustion in and by them proceeds, gas is generated.

3252.—CHANDLER, S., York Street, London Road, Southwark, and STEVENSON, G. W., Great George Street, Westminster, "*Improvements in apparatus used in the manufacture of gas.*" Patent dated Sept. 23, 1874.

This invention is designed for removing the pressure from retorts used in the manufacture of gas, which pressure is occasioned by the dip-pipes being sealed in the fluid of the hydraulic main. This seal it is purposed to remove during the time the gas is being generated, and to replace when the retort is not in action, the apparatus to accomplish this sealing and unsealing being self-acting.

The invention which is an improvement upon patent, No. 2416 (Aug. 14, 1872), is effected by the addition of a cup vessel, placed upon the top of the dip-pipe. This vessel may be charged with mercury, water, tar, or other liquid, and into it is introduced a holder or enclosed cylinder connected by a rod to the moveable dip-pipe, which rises and falls in the cup, which may also be charged with mercury, tar, or other liquid, and in the water of the hydraulic main. To the top of the holder is attached a chain or cord, which passes over a pulley and sustains a counterbalance weight.

The action of the apparatus is as follows:—When the retort has been charged with coal or other gas-producing substance and the lid secured, the gas evolved will cause the holder to rise. This will lift the dip-pipe out of the fluid in the hydraulic main, and when gas ceases to be evolved or the lid of the retort is removed, the holder will fall, and with it the dip-pipe, which will become sealed, and so continue until the retort has been again charged and the lid secured.

3257.—LASCELLES, C. T. E., Brockley, Kent, "*Improvements in the utilization of gas-engines as motors for tramway cars and similar vehicles.*" Provisional protection only obtained. Dated Sept. 23, 1874.

This invention consists in arranging and connecting the gas-engine and the wheels of the vehicle in such a manner that the progress or movement of the same may be stopped without stopping the engine; so that, however numerous the stoppages may be throughout the day, the stopping and starting of the engines will not be necessary, and the delay and trouble, which, as is well known to those familiar with the working of these engines, would otherwise arise from frequent stopping and starting, is therefore avoided.

3281.—DAY, ST. J. V., Glasgow, "*Improvements in the manufacture of gas, and in the means or apparatus employed therefor.*" A communication. Patent dated Sept. 25, 1874.

This invention relates to an improved method of manufacturing from hydrocarbons permanent gas, which may be used for lighting and heating, for actuating motive-power engines, and for other generally similar purposes wherein gas is employed.

For the purpose of this invention those substances containing hydrocarbons, which may be either partially or wholly volatilized below a red heat, are available. Among the most suitable of such substances may be mentioned petroleum and its products, shale and coal oils and their products, naphtha, gasoline, coal tar, pitch, gums, bitumen, resin, grease, fat, oils, cannel coal, gas coal, shales, wood, lignites, peat, and turf.

In manufacturing gas according to this invention, the hydrocarbon to be treated is placed in a still or retort, and subjected to a heat sufficient to vaporize its volatile contents. The vapours so produced are conducted by pipes, which may be cased in non-conducting material or otherwise protected against condensation of the vapours during their passage to the interior of a retort, chamber, pipe, or pipes, mantained at a full red to a white heat, and by being submitted to the hot interior of the retort or pipe, the vapours are converted into permanent gas and allowed to pass off for use. To ensure the entire conversion of the condensable vapours into permanent gas, and to avoid portions being carried off mechanically by the permanent gas, it is a convenient arrangement to have inside the retort a cylinder or pipe, extending nearly its entire length; the end of the cylinder or pipe next the door of the retort being furnished with a clay or other stopper, capable of being removed when desired, the other end being open. The pipe conducting the vapours should be inserted into and secured to this cylinder or pipe near its end next the door of the retort, so as to cause the vapours

and gases produced to travel nearly the entire interior length of the cylinder, and then to return through the entire interior length of the retort to the gas exit-pipe, which is placed on the mouthpiece, as usual in ordinary coal gas-retorts. Other forms of apparatus may be employed to effect the same results—such as placing the still or retort, in which hydrocarbon is vaporized, inside the retort in which the vapours are converted into permanent gas, passages or openings being made for charging and discharging the vaporizing still or retort, and for the passage of the hydrocarbon vapours to the interior of the external retort, the space between the sides of the respective retorts being filled with the hydrocarbon vapours and gas, which are comparatively poor conductors of heat. These maintain the necessary difference of temperature between the vaporizing and more highly heated external retort or vessel, such space being proportioned to the temperature at which the hydrocarbon to be treated is vaporizable.

3307.—REDWOOD, T. B., Finchley, Middlesex, "*Improvements in the manufacture of gas for burning.*" Patent dated Sept. 26, 1874.

This invention has for its object the production of a permanent gas rich in carbon from petroleum and other hydrocarbon oils, including the oils obtained from coal, shale, peat, and other sources. This gas is produced by subjecting the vapours of such hydrocarbons to a bright red heat, applied through the medium of copper or an alloy of copper, such as brass, and this is effected by introducing the hydrocarbon oil or its vapour gradually and continuously as the conversion takes place, into a red-hot cylinder or converting chamber composed of copper or an alloy consisting principally of copper filled with scraps, turnings, wire, or wire gauze of the same metal, so arranged as to conduct the heat as equally as possible to every part of the chamber, and to present as large a heating surface as possible to the vapour. In this way a temperature of bright redness may be applied without causing any material deposition of carbon from the gas produced, which will consist principally of olefiant gas or of other gas or gases rich in carbon, and which may be diluted with water gas or other gas which is not rich in carbon, to render it suitable for use as a gas for burning as a source of light.

But although the vapours of liquid or solid hydrocarbons such as described may, if due care be exercised, be converted into permanent gas with little or no deposition of carbon by the method described, it is preferred to effect the conversion with the intervention of water gas by the following method:—The water gas used is obtained by passing superheated steam over the surface of incandescent carbon, at a high temperature, when a mixture of hydrogen gas and carbonic oxide is produced, together with some carbonic acid, which is removed by means of slaked lime before using the gas. The purified water gas so produced is introduced simultaneously with the hydrocarbon oil or its vapour into the cylinder constructed, filled, and arranged as already described in the process for making gas without the intervention of water gas; but in this case the cylinder and its contents may be maintained at a higher temperature, usually called a cherry-red heat, and in order to prevent too great a reduction of temperature by the introduction of the water gas, it is conveyed through red-hot tubes before it enters the cylinder or converting chamber. The proportion of water gas used in this process in relation to the hydrocarbon oils may be regulated by suitable valves or taps, so as to yield a mixed gas having an illuminating power such as may be required for burning as a source of light or otherwise; it may be further mixed with a richer gas, made without or with a smaller quantity of water gas, or with water gas itself.

3346.—ROBINSON, F., Leytonstone, Essex, "*An improved mode of and apparatus for the manufacture of gas.*" Patent dated Sept. 30, 1874.

The object of this invention is to produce carburetted hydrogen gas of a purer quality, higher illuminating power, and at a cheaper cost than by the processes heretofore employed. The form of apparatus whereby it may be carried into effect will vary considerably according to circumstances, but the principle of construction will always remain the same. The basis of the gas is pure hydrogen, obtained by the decomposition of water. This hydrogen, which, when in a pure state, possesses but feeble illuminating power, is carburetted, and rendered a highly illuminating gas by causing an olefiant gas, obtained by the decomposition of the vapour of a hydrocarbon, to mix therewith. To this end it is preferred to use a liquid hydrocarbon, or an oil, fat, or grease which will liquefy at a moderately low temperature. This liquid is contained in a tank placed above the level of the gas-generating apparatus, and is allowed to drop in regulated quantities into a retort, in which the liquid will be converted into vapour. From this retort it is conducted by a pipe to a second retort or vessel, which is heated to a bright red heat, whereby it becomes decomposed, and is converted into a permanent olefiant gas very rich in carbon. If special burners, constructed for the purpose, are used, this rich gas may be burned without admixture with any other gaseous fluid; but it is preferred to add pure hydrogen thereto, so as to increase its volume, and this is done by decomposing steam or the vapour of water in the second retort or vessel, so that the two gases in a nascent state may be brought into contact, when they will mix and become chemically combined, so as to produce a permanent gas of high illuminating power. The water is supplied in regulated quantities, and by controlling the supply of the two liquids, gas of any desired illuminating power may be obtained. The gas when produced is conducted to a gasholder, from which the burners may be supplied by means of suitable pipes.

3460.—M'KAY, W., Carnoustie, N.B., "*A new or improved apparatus for heating by gas.*" Provisional protection only obtained. Dated Oct. 9, 1874.

This invention has for its object to economize the consumption of gas by a self-acting arrangement, which, when the apparatus is not used for heating an object, shuts the gas off; but when so used, the weight of the object being, or about to be, heated opens a valve by which the gas is turned on.

The apparatus is attached to an ordinary gas-pipe, and consists of an upright stem, in the lower part of which is a valve; the valve is closed by means of a spring lifting it upwards. On the upper part of the spindle which carries the valve, the frame upon which the articles are heated is held, and through the frame the burners, in which the gas is burned, project so as to distribute the flame on the under surface of the articles.

The moveable parts of the apparatus, through or about which the gases pass, are surrounded by water-seals to keep them tight.

From the lower part of the apparatus a very small pipe is led, which terminates at or near to the large burner or burners. Through this small pipe gas is always allowed to pass and burn in an extremely small jet. The object of this is to ignite the gas at the large burner or burners at the moment the gas is allowed to pass therethrough by the weight of the article to be heated being placed on the apparatus, and so opening the valve.

3487.—FOULIS, W., Glasgow, "*Improvements in charging and drawing retorts, and in the machinery or apparatus employed therefor.*" Patent dated Oct. 10, 1874.

This invention, which relates to a new or improved arrangement or construction of machines for charging and drawing retorts, consists, in respect of the charging machines, of a framing carried on wheels, by which the machine is traversed in front of the retorts. One side of the framing is vertical, and upon this side the charging machinery is carried in a sliding saddle or guide. The object of making one side of the framing vertical is that the charging machinery may slide up and down thereon to correspond with the level of any retort in a series.

The charging mechanism—namely, that by which the materials are passed into the retorts—consists of a scoop, attached to a circular bar or block, fitted in bearings in which it is capable of being turned round and back again, after the manner set forth in a patent granted to the present inventor, No. 153, A.D. 1874; but, under this invention, the drum which actuates or moves the scoop into and out of the retort, and turns it over to deposit the charge in the retort, is carried upon a shaft, which is also vertical, and parallel to the vertical face of the framing. The drum is provided with a feather, which enters a groove extending the entire length of the vertical shaft, so that it is raised or lowered correspondingly with the raising and lowering of the charging apparatus. On the lower part of the framing is situate the hydraulic cylinder by which the vertical shaft and the gearing connected therewith is actuated, this being effected by a toothed rack attached to the same, gearing into a pinion, by chains or other mechanical equivalent.

The charging-machine is raised and lowered on the vertical face of the framing either by racks and pinions, chains, or by means of an hydraulic ram.

Another part of this invention consists in attaching the scoop to the machine by means of a T-headed catch, fitting into a correspondingly shaped hole, or by a dovetail, so that the scoop can be readily removed from, or attached to, the machine; and in this manner the necessity of using trays for charging the scoops, which have hitherto been permanently fixed to the machine, is dispensed with, as the scoops, being removable, are charged at once on being disconnected from the machine, and when recharged are reattached thereto.

The improvement in machines for drawing the charge from retorts, which constitutes the second part of this invention, consists in suspending the hydraulic cylinder, which carries the rake, from a chain passed over a pulley in the upper part of the framing in which the drawing mechanism is supported; the chain is connected to a weight or rack and pinion, by which the hydraulic cylinder is maintained at any required level. A second hydraulic cylinder, placed vertically, and provided with a piston and slide-valve, is attached to the framing, and the rod of the piston in the cylinder is connected by a chain to the rear end of the hydraulic cylinder which carries the drawing rake. The upper and lower ends of this second hydraulic cylinder are connected to the front and rear ends of the hydraulic cylinder which carries the rake. The attendant in charge of the machine, by moving the slide-valve upwards, allows the water to flow into the lower part of the vertical hydraulic cylinder, so that its piston begins to rise, whilst at the same time the water passes therefrom into the rear of the rake cylinder and pushes it forward into the retort, the rake being carried clear above the charge in the retort by the raising of the piston of the vertical hydraulic cylinder. So soon as the rake has reached the end of its stroke the attendant lowers the slide-valve, thus opening the upper port of the vertical hydraulic cylinder, thereby depressing the piston therein, which action lowers the rake on or into the charge to be drawn, and at the same time the water passing through the upper exit port of this cylinder to the front end of the rake cylinder causes the piston therein, together with the rake, to be drawn back, whilst the water previously used for forcing the rake into the retort escapes through the central port of the slide-valve.

In place of using a slide-valve, a two-way cock or its equivalent may be employed.

3489.—HASELTINE, G., Southampton Buildings, London, "*Improvements in apparatus for feeding gas retorts, and for other analogous purposes.*" A communication. Patent dated Oct. 10, 1874.

This invention is designed for the purpose of enabling the scoops to be worked with greater facility and with less loss of gas during the operation of feeding. Hitherto they have been carried from the coal heap to the retort by three men, one at the end or handle, and one at either end of a horse placed underneath the body of the scoop. By this method only one man is required for the work. A travelling under-carriage is provided, upon which a bed is constructed for the scoop to rest in, at the same level as the retorts to be fed. A scoop so constructed and arranged can be wheeled to the coal heap and filled; the retort can then be opened and emptied of its coke, and the scoop wheeled round so as to enable it to be run right into the retort, turned over, emptied, and finally drawn back again on its bed, wheeled away, and if necessary refilled whilst the door of the retort is being closed up. In order to make the same under-carriage answer for retorts on different levels, the heights of the beds are made adjustable. The method preferred consists of a fixed stud or spindle on the under-carriage, over which there passes a tubular support for the bed. These tubular supports are made of different lengths, so as to carry the scoops on a level with the several layers of retorts. Other means of making them adjustable may be substituted for those described.

APPLICATIONS FOR LETTERS PATENT.

2463.—HIGGINSON, A., Liverpool, "Improvements in engines and pumps." July 8, 1875.

2464.—CARLYON, P., Denmark Hill, Surrey, and TITTERTON, F., Cloudesley Street, London, "Improvements in tools or apparatus for expanding tubes." July 8, 1875.

2473.—WHITE, W., Pontypool, Mon., "Improvements in apparatus used in the manufacture of gas." July 9, 1875.

2492.—KING, T., Oldbury, Worcester, "Improvements in direct-acting steam-pumps." July 10, 1875.

2499.—PATRICK, R., Canada, "Improvements in rotary pumps and engines." (Complete specification.) July 12, 1875.

2508.—LAKE, W. R., Southampton Buildings, London, "An improved liquid-meter." A communication. July 12, 1875.

2509.—LAKE, W. R., Southampton Buildings, London, "Improvements in galvanic apparatus and in contrivances connected therewith applicable to telegraphic and lighting purposes." A communication. July 12, 1875.

2523.—NEWTON, H. E., Chancery Lane, London, "Improvements in apparatus applicable to burners for lighting purposes." A communication. July 13, 1875.

2539.—NICHOLAS, J., Manchester, "Improvements in apparatus for indicating the levels of water in reservoirs and other places." July 15, 1875.

2545.—WILSON, M., Brixton, London, "An improved stench-trap." July 15, 1875.

GRANTS OF PROVISIONAL PROTECTION.

2243.—NORTON, C. D., Stoke Newington, London, "An improved method of and apparatus for the saving of gas, and for economizing the use of gas in railway trains, public buildings, or for other purposes." June 18, 1875.

2270.—WEIGHT, J. R., Uddingston, Lanark, "An improvement in the construction of regenerative gas-furnaces." June 22, 1875.

2312.—CLELAND, W., Linacre, Lancs, "Improvements in jet apparatus for giving motion to fluids." June 24, 1875.

2320.—BOULTON, M. P. W., Oxford, and IMRAY, J., Southampton Buildings, London, "Improvements in helical pumps." June 25, 1875.

2328.—PEEBLES, D. B., Edinburgh, "Improvements in governors or apparatus for regulating or controlling the pressure and flow of illuminating and other gas." June 26, 1875.

2334.—SMYTH, W. W., Maidstone, Kent, and HUNT, G. G., New Cross, London, "Improvements in gas-engines." June 26, 1875.

2345.—MORGAN-BROWN, W., Southampton Buildings, London, "Improvements in pumps." A communication. June 28, 1875.

2346.—WEST, J., Maidstone, Kent, "Improvements in apparatus for discharging gas-retorts." June 28, 1875.

2358.—ODAMS, J., Fenchurch Street, London, and BLACKBURN, R., Exeter, "Improvements in apparatus for treating sewage." June 29, 1875.

2381.—Brothers, F. W., Cheltenham, Gloucester, and Brothers, C., Blackburn, Lancs. "Improvements in apparatus used in the manufacture of gas." June 30, 1875.
2387.—Holmes, J. M., Birmingham, "Improvements in gas-stoves for cooking and heating." A communication. June 30, 1875.
2401.—Banner, E. G., Billiter Square, London, "Improvements in house traps for preventing the passage of sewer gas into dwellings from sewers, drains, or cesspools." July 2, 1875.
2406.—Lyttle, W. A., Hammersmith, London, "Improvements in the means and apparatus for producing animal charcoal and other filtering materials for use as purifiers of liquids and gases, and for reviving or restoring the same when exhausted by use." July 3, 1875.
2412.—Brookes, W., Chancery Lane, London, "Improvements in means or apparatus for the manufacture of illuminating gas from petroleum or other hydrocarbon oil." A communication. July 3, 1875.

NOTICES TO PROCEED.

818.—Chiverton, E., Southsea, "Improved means and apparatus for lighting gas lamps and burners." March 5, 1875.
826.—Johnson, J. H., Lincoln's Inn Fields, London, "Improvements in traps or apparatus for separating liquids from vapours or gaseous fluids." A communication. March 5, 1875.
839.—Cooke, J., Durham, "Improvements in the construction of rotary engines and pumps." March 6, 1875.
950.—Cooke, J., Durham, "Improvements in the construction of rotary engines and pumps." March 15, 1875.
2076.—Wood, R. J., Glasgow, "Improvements in retorts, furnaces, and other close heating vessels or chambers." June 5, 1875.

INVENTION PROTECTED FOR SIX MONTHS ON THE DEPOSIT OF COMPLETE SPECIFICATION.

2499.—Patrick, R., Canada, "Improvements in rotary pumps and engines." (Complete specification.) July 12, 1875.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

101.—Fyfe, D. A., and Bowers, W. H., Manchester, "Improvements in the method of and in apparatus for producing gas or gases for heating and for illuminating purposes." Jan. 12, 1875.
153.—Newton, H. E., Chancery Lane, London, "Improvements applicable to burners for lighting purposes." A communication. Jan. 14, 1875.
214.—Box, J., Westminster, London, Aubertin, E., Boblique, L., and Leplay, H., Paris, "Improvements in the disinfection of solid and liquid matters, such as night soil, sewage, either together or separately, gas and other foul waters." Jan. 20, 1875.
892.—Taylor, F. B., Newton Terrace, London, "An improved steam-engine, also applicable for use as an air, water, or other fluid motor." March 10, 1875.
930.—Findlay, J., Glasgow, and Jack, W., West Calder, "Improvements in the destructive distillation of coal, shale, and other bituminous substances, and in the apparatus or retorts employed therefor." March 12, 1875.
1662.—Buchan, W. P., Glasgow, "Improvements in water-closets." May 4, 1875.
1762.—Munro, W., Glasgow, "A new or improved pump for forcing water, which may be used for extinguishing fires, or for other purposes." May 11, 1875.
1895.—Hills, F. C., Deptford, London, "Improvements in the purification of gas, and in the preparation of materials to be used in the said purification." May 24, 1875.

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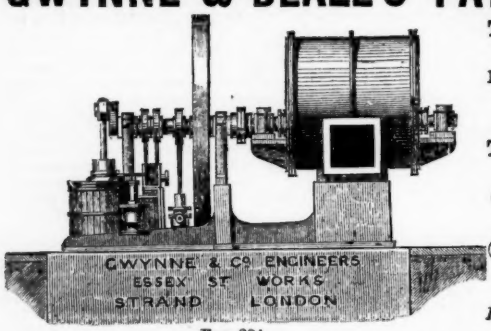

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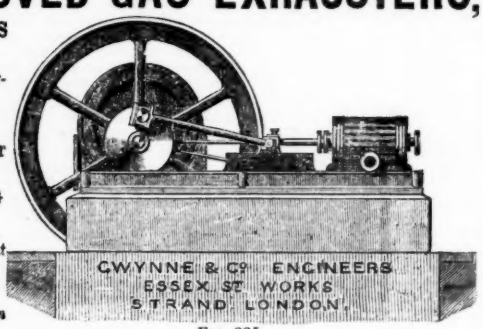

Fig. 225.

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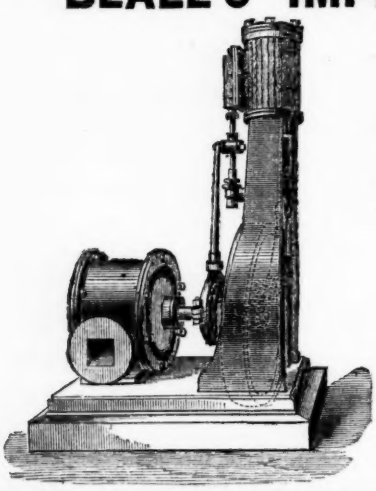

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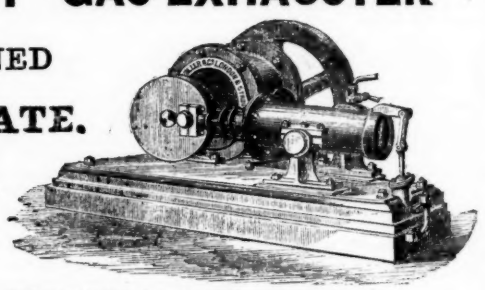

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WANTED immediately, one or two FITTERS, used to fitting up retort-beds and all ironwork connected therewith.

Address No. 181, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a young Man, aged 23, a situation as CLERK or Meter Taker and Collector. Has been four years in present situation, and can produce testimonials as to ability and character.

Address No. 182, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Youth, about 18 or 19 years of age, with some experience at Gas-Works, as UNDER-FOREMAN for the San Paulo Gas Company's Works, in Brazil.

Apply to the SECRETARY, Pinner's Hall, GREAT WINCHESTER STREET, E.C., by letter with testimonials.

WANTED, by a steady, respectable young Man, a situation as METER INSPECTOR, Meter Fitter and Fixer. Would be willing to assist in service-laying or as storekeeper. Good references.

Address No. 176, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Bricklayer, as a Retort-Setter, and for the general repairs of a Gas-Work. To a steady and good workman the situation will be permanent.

Address, stating wages required, and references, to No. 174, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the son of a Gas Engi-neer, the MANAGEMENT of a Gas-Work, where a stoker is kept in the summer time, or Assistant Manager of a larger work, and to take the out-door superintendence, the reading of meter indices, and collection of accounts, &c.

Address No. 179, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Gas Company, a good GAS-FITTER, for general house work or repairs. To an experienced and steady man the employment will be permanent.

Address to No. 173, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C., stating wages required and giving references.

TO GAS ENGINEERS.

WANTED, for a Railway in the North of England, a competent Man as SUPERINTENDENT over several small Gas-Works. He must thoroughly understand the manufacture of gas, erection of works, laying of mains, and maintenance and repairs of fittings.

Address No. 175, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

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For Companies to issue to their Gas Consumers.

Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

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CLERK of the Works wanted. State age, experience, references, and salary required, to W. J. WARNER, Engineer.

THE Advertiser, aged 28, having over eleven years experience in both in and out door work, main and service laying, testing same, &c., desires a RE-ENGAGEMENT. Also uses the photometer. Good testimonials. Lately returned from abroad, and no objection to proceed abroad again.

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FOR SALE—A 4-horse Engine and Ex-HAUSTER, to pass 10,000 cubic feet per hour. Self-acting bye-pass and two gas-valves, 8-in. connexions and exhauster governor.

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The Committee do not bind themselves to accept the lowest or any tender.

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THE Carlisle Gas Committee are pre-pared to receive TENDERS for the supply of from 7000 to 10,000 tons of best screened GAS COAL. Deliveries to extend, as may be directed, from August, 1875, to March or June, 1876.

The Coals are to be the best of their kind, and free from sulphur, bats, bind, refuse, and dirt, and must be delivered free at any of the railway stations in Carlisle.

Payments will be made monthly, if, and so long as, the contract shall be duly fulfilled.

Sealed tenders, specifying the description of Coals and the pits at which they are to be raised, must be endorsed "Tender for Coals," and delivered on or before the 3rd day of August, 1875.

J. HEPWORTH, Manager.

Gas-Works, Carlisle, July 14, 1875.

EXHIBITION OF SANITARY AND EDUCATIONAL APPLIANCES in connexion with the SOCIAL SCIENCE CONGRESS to be held at BRIGHTON, from the 6th to the 16th of October next.

Apply to Mr. JAS. ROBINSON, Secretary to the Managing Committee, 1, Adam Street, ADELPHI, W.C.

IN THE MATTER OF BRONNER'S PATENT BURNERS.

NOTICE is Hereby Given that Julius Brönner, on the 20th of April, 1875, in a suit in Chancery, 1874, B 365, obtained an injunction perpetually restraining the Defendant, his Agents, Servants, and Workmen, from in any way advertising or offering for sale, or selling, or from in any manner causing to be advertised, or offered for sale, or sold as "Real Brönner," or "Brönner," or "Broehner" Burners, any Burner not manufactured by or for the Plaintiff, Julius Brönner, or by his Agents.

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55, Chancery Lane, London,
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JULIUS BRÖNNER, Frankfort-on-Maine.

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Specifications and all particulars to be had on application to Mr. Woodall, Engineer, at the Gas-Works, Meadow Lane.

Endorsed tenders, addressed to the Chairman of the Gas Committee, to be sent to my Office on or before Saturday, the 24th inst.

The lowest or any tender not necessarily accepted.

By order,
C. A. CURWOOD, Town-Clerk.

Leeds, July 16, 1875.

WOLSTON'S TORBAY IRON PAINTS.

THE Torbay and Dart Paint Company, Limited, 23, Great George Street, Westminster, S.W., having been informed that PAINTS not manufactured by them are being offered to Gas Companies and the public as "WOLSTON'S," hereby give notice that they will TAKE PROCEEDINGS against any persons infringing their rights as sole proprietors and manufacturers of Wolston's Torbay Iron Paints.

(See Advertisement on another page.)

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To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.
To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

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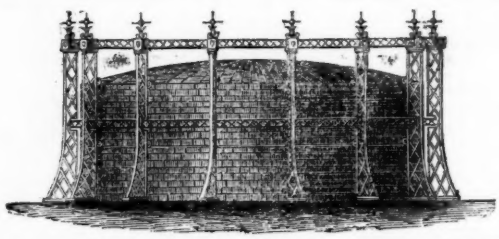

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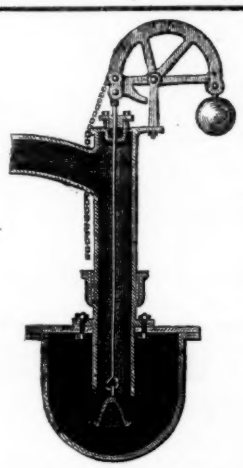

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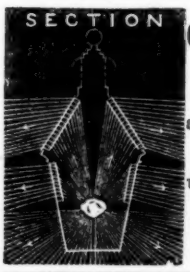

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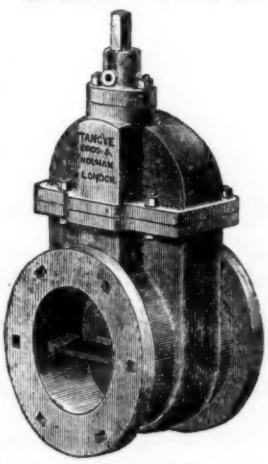

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These Paints have been for many years extensively used in Her Majesty's Royal Dockyards, Woolwich Arsenal, the Shorncliffe and Curragh Camps, War Departments, and Colonies, and are largely supplied to Railway, Harbour, and GAS COMPANIES, Shipowners, Engineering Establishments, Railway Carriage and Waggon Works, and the Paint Trade generally. They are the BEST PROTECTORS of IRONWORK, even arresting corrosion after it has set in; and their base being oxide of iron, they are free from those properties which make lead paints so destructive to ironwork. They do not scale or blister, are not affected by great heat, and are the only Paints which will resist the effects of sulphuretted hydrogen. Their DURABILITY and covering properties have borne the test of A QUARTER OF A CENTURY'S PRACTICAL TRIAL.

The undermentioned colours—ground in best linseed oil, and requiring only before use to be thinned down in the ordinary way—are kept in stock:—

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Dart Green.	Slate.
Dart Yellow.	Buff.
Brixham Black.	Torbay Chocolate.
Light Blue.	Cream Colour.
Dart Brown.	Dart Umber.
Imperial Stone.	Light Stone.
Bronze Green.	Salmon Colour.
Navy Green.	Lead.
Carriage Red.	Dark Stone.
Light Lead.	Crystal Palace Blue.
Light Green.	Iron Grey.

All other Colours made to order.

PRICES and TESTIMONIALS on APPLICATION.
(See Notice on another page.)

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WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of
CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

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FIRE CLAY & BRICK WORKS,
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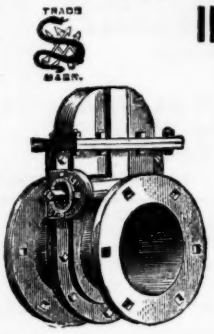
CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B. ON CLYDE.
Prices on application.

B. DONKIN & CO.'S
IMPROVED GAS-VALVES
WITH WROUGHT-IRON PINIONS,



List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
VALVES MADE WITH OUTSIDE RACKS TO ORDER.
ALSO, SCREW WATER-VALVES WITH GUN-METAL FACES.
ALSO SOLE MAKERS OF
J. BEALE'S NEW PATENT GAS EXHAUSTERS.

B. DONKIN & CO.,
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MAKERS OF STEAM-ENGINES,
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IN THE
PURIFICATION OF ILLUMINATING GAS
BY
SPENCE'S PATENT DRY COPPERAS.

The only purifying material which removes by one process, without injury to the purifiers, all Ammonia and Sulphuretted Hydrogen. It has been in use for upwards of five years at some of the largest Gas-Works in the Kingdom.

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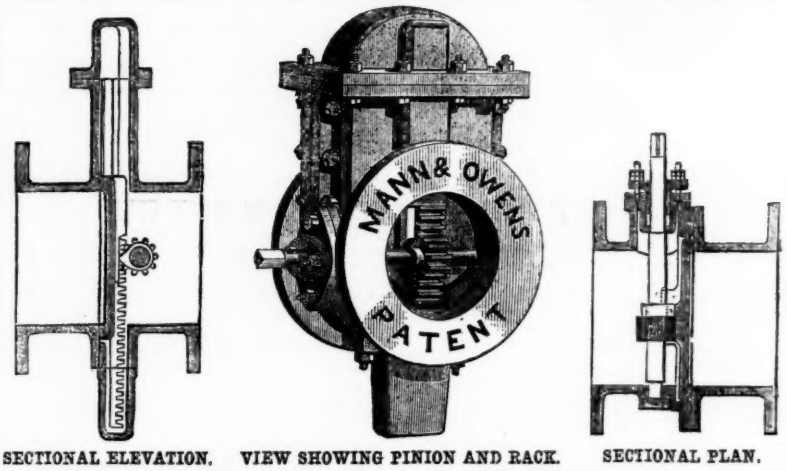
VICTORIA CHEMICAL WORKS, BRADFORD, MANCHESTER;
SOLE MANUFACTURERS OF SPENCE'S PATENT DRY COPPERAS,
SPENCE'S PATENT GAS DEODORIZER, AND MUDIE'S DISINFECTANT;
MANUFACTURERS OF
SULPHATE OF AMMONIA, VITRIOL, COPPERAS, &c.;
PURCHASERS OF SPENT OXIDE AND AMMONIACAL LIQUOR, AND CONTRACTORS FOR THE PURIFICATION OF COAL GAS.

MANN & OWENS' PATENT GAS-VALVE.



SECTIONAL ELEVATION. VIEW SHOWING PINION AND RACK. SECTIONAL PLAN.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:
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PRICES, SIZES, AND FULL PARTICULARS ON APPLICATION.

J. & J. BRADDOCK,

GAS ENGINEERS,

GLOBE METER-WORKS, OLDHAM,

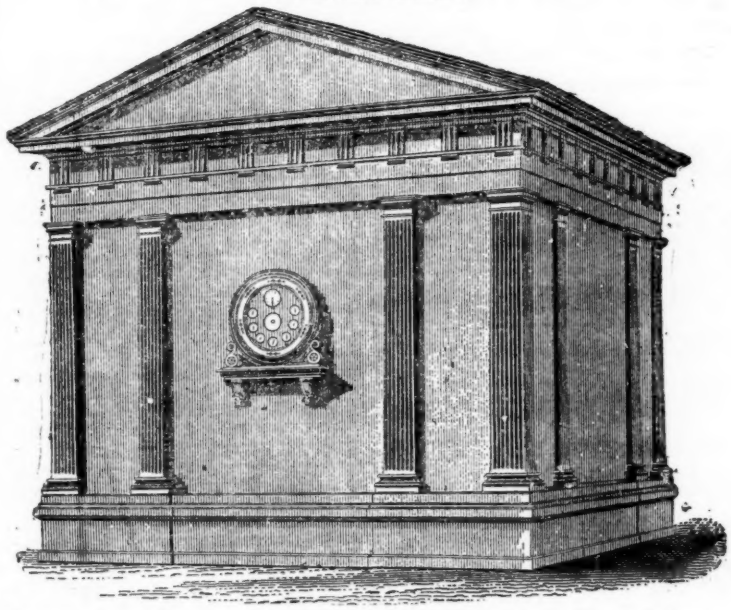
MANUFACTURERS OF

WET & DRY CONSUMERS GAS-METERS

OF THE HIGHEST EXCELLENCE;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



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WITH PLANED JOINTS.

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Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

TERMS, &c., ON APPLICATION.

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STEAM-ENGINES and EXHAUSTERS, separately or combined.

FOUR-WAY VALVES, one of which is equal to three ordinary Valves.

STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

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A Pamphlet containing Eighteen Illustrations of the foregoing, with letterpress of the construction of Works, post free, 2s. 6d.

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"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—*Artisan*

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, ROTHERHAM.

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FOR REMOVING THE

CARBONACEOUS INCRUSTATION FROM GAS-RETORTS.

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Are prepared to supply and erect their

PATENT MOVEABLE SEALS

FOR DIP-PIPES,

Or to grant Licences for the Manufacture and Use of the same.

Particulars may be obtained on application at the Offices,

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WOOD PURIFIER SIEVES,

Which have now been used for twelve years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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Bends, Tees, and Irregulars,

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Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

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Yields 10,700 cubic feet of 32·77-candle gas per ton, and 9½ cwts. of coke, containing 11 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

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Of every description delivered f.o.b. United Kingdom, or cost freight and insurance Abroad, upon lowest terms.

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WYLAM WOOD CANNEL COAL WORKED FROM ABOVE COLLIERY.

Analysis—10,280 cubic feet of gas per ton of Coal, having an Illuminating Power of 26·2 Sperm Candles, and yields 13¼ cwt of Coke per ton of Coal.

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Can offer a CANNEL COAL yielding a large quantity of Gas of superior quality.

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POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 13½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

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The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

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Scotch Churls

PRESENT PRICE:

5s. 6d. per Ton at Pit.

8s. 9d. ,, F.O.B.

Cubic Feet. 10,000 .. Illuminating Power. 20 candles. .. Coke (sup. qual.). 12 cwt.

CANNEL COAL.

COPPA COLLIERY, MOLD,

Beg leave to call the attention of Gas Companies to the superior quality of their

CANNEL FOR GAS-MAKING PURPOSES.

This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·8-candle gas.

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Waggons supplied for delivery by railway to any part of England or Wales.

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NEAR SHEFFIELD,

STRONGLY RECOMMEND A TRIAL OF THEIR

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Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

APPLICATIONS FOR PRICES, &c., TO BE SENT DIRECT TO THE COLLIERY, AS ABOVE.

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LIMITED,
COLLIERY PROPRIETORS,
(HEAD OFFICES: WIGAN, LANCASHIRE; DISTRICT OFFICE: 18, BENNETT'S HILL, NEW STREET, BIRMINGHAM),
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SUPPLY THE BEST
WIGAN ARLEY MINE SCREENED GAS COAL & NUTS,
THE BEST HAND-PICKED ROUND CANNEL,
ALSO SMALL OR GAS CANNEL, ETC.

The Wigan Coal and Iron Company, Limited, incorporated 1865, are the exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL COLLIERIES.

ALBERT GAS COAL.
THE DERBYSHIRE
SILKSTONE COAL COMPANY,
LIMITED,
CAN OFFER A
GAS COAL
Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
Weight of coke in lbs. per ton of coal	1,465

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Works: LOCHORE by LOCHGELLY, FIFESHIRE. Office: 19, MAITLAND STREET, EDINBURGH.

This Company request attention to the very superior quality of their Cannel Coals.

1. The following are the practical results given by Dr. Wallace, of Glasgow, of analyses of their Lochore and Capledrae Cannels:—

	Sample worked at Capledrae.	Sample worked at Lochore.
Gas per ton of coal, at 60° Fahr. and 30 inches barometric pressure . .	13,095 cubic feet.	11,760 cubic feet.
Illuminating power, in standard sperm candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	32·91	34·83
Value of 1 cubic foot of gas in grains of sperm	780	836
Equivalent of a ton of coal in pounds of sperm candles	1,459	1,404
Durability of 1 cubic foot by 5-inch flame	69 minutes.	71 minutes.
Gravity of the gas (air = 1000)	596	594

Remarks.—This (the sample from Capledrae) is a Cannel Coal of first-class quality, giving 13,000 feet of 33-candle gas. It contains only a minute proportion of sulphur, and the ash is almost quite white. The coke is of rather inferior quality.

Remarks on Sample from Lochore.—This is a Cannel Coal of first-class quality, giving a large yield of very rich gas and a coke of medium quality.

2. The following are the practical results of analyses by Dr. Wallace of the Company's Waverley Cannels:—

	Capledrae Waverley.	Lochore Waverley.
Gas per ton of coal, at 60° Fahr. and 30 inches barometer	9,120 cubic feet.	11,145 cubic feet.
Illuminating power, in standard candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	36·62	33·09
Value of 1 cubic foot of gas in grains of sperm	878	794
Equivalent of a ton of coal in pounds of sperm candles	1,145	1,264
Durability of 1 cubic foot of gas by 5-inch flame	80 minutes.	67 minutes.
Gravity of the gas (air = 1000)	677	597

Remarks on the Sample of Capledrae Waverley.—This Coal gives fully 9000 feet of gas of 36½ candles, and is admirably adapted for bringing up the quality of gas made from common coal or inferior qualities of cannel. The tests were made at a rather high temperature, this being one of the coals that stand a very high heat without serious diminution of the illuminating power of the gas The coke contains 60 per cent. of ash, and is therefore almost valueless, but the proportion of sulphur is very moderate.

Remarks on the Lochore Waverley.—This is a first-class Cannel Coal, giving 11,000 cubic feet of 33-candle gas. The quantity of sulphur is very minute, and the ash is nearly white. The coke is of inferior quality, but not wholly valueless.

Applications for full Copies of Analyses and Prices may be made to the Company, at
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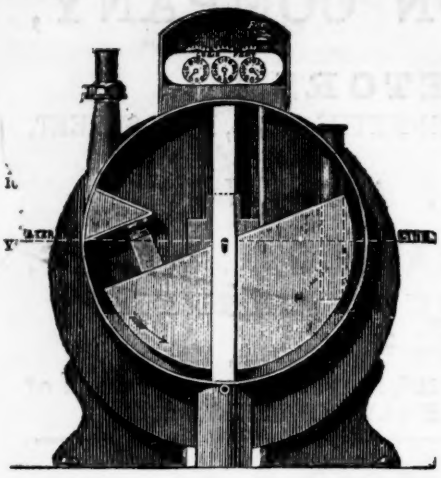

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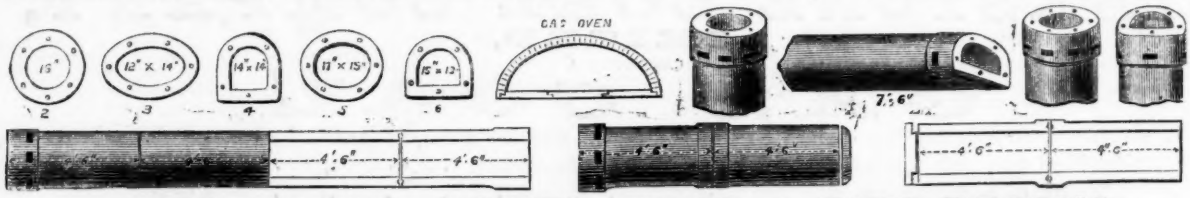

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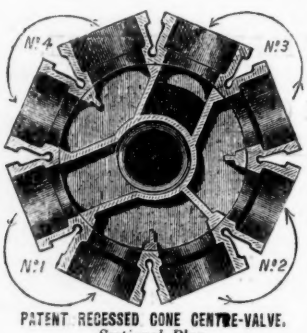

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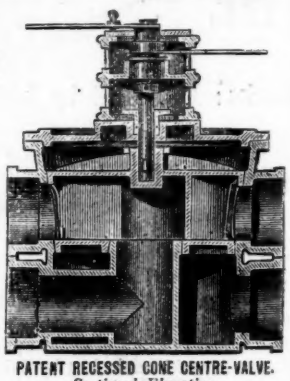

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Invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

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for clearing out Mains, Services, and Interior Fittings—65s. net.

Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.

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